[INERALOGICAL ABSTRACTS

(Vol. 7, No. 3, September, 1938.)

Notices of Books.

ANNSEN (Albert). *A descriptive petrography of the igneous rocks.* Vol. 4, Part I. *The feldspathoid rocks.* Part II. *The peridotites and perknites.* Chicago (Univ. Chicago Press), 1938, xvii+523 pp., 11 pl., 180 text-figs. Price $4.50. (London agents: Cambridge Univ. Press. Price 21*s.*)

he first volume of this comprehensive treatise on igneous rocks peared in 1931 [M.A. **4**–483] and the third in 1937 [M.A. **6**–483]. The pleted set of four handsome volumes is a valuable work of reference. larger part (Part I, pp. 1–395) of the present volume deals with the athoid rocks under families 13–25 (families 0–12 in vols. 2 and 3). peridotites and perknites (Part II, pp. 396–472) are also labelled ilies 0–12 and 44X. Since the class grouping is not clearly set out e table of contents nor in the head-lines in the text, this duplication he numbering of families is confusing. Detailed indexes of authors, ities, and rock-names to the systematic descriptive portion (vols. are given, so that it is now possible to refer to the volumes without mastering the classification and involved numbering of the classes, rs, and families. Seventy-six portraits of petrologists are given in volume, making 168 in all—a unique and interesting collection.

L. J. S.

OCHNIKOV (V. N.)] Лодочников (В. Н.). Основы микроскопических методов исследования кристаллического вещества. [*The foundation of microscopical methods for the determination of crystalline matter.*] Госхимтехиздат [Goskhimtekhizdat], Leningrad, 1932, 2nd edition, 194 pp., 84 figs., 2 folding tables.

his book, written in Russian, gives a good account of the optical erties of crystals and of the methods used for their determination. y important points, often barely mentioned in other text-books, are icularly emphasized and elucidated. Such is the obvious, but often red, statement that the radius-vector of the optical indicatrix is vibration direction and not the propagation direction of the light There is also a section dealing with the determination of the tion of extinction relative to cleavage planes in sections. A new od is given for the determination of the relative value of the

refractive indices of two adjoining colourless minerals in thin sectio minerals of lower index appear faintly golden-yellow at the cont with a mineral of a higher index which appears bluish-green.

S. I. T

[Fersman (A. E.)] Ферсман (А. Е.). Занимательная минералог [*Entertaining mineralogy.*] Издание четвертое, Ленинград, 'Мо дая Гвардия'. [Fourth edition, Leningrad, 'Molodaya Gvardiy 1935, 252 pp., 1 col. pl., 99 text-figs. Price 4 r. 50 k.

—— —— [Fifth edition], Москва-Ленинград, Изд. Детской литерату [Moscow-Leningrad, Publ. Literature for children], 1937, 240 p 5 col. pl., 1 map, 180 text-figs. Price 10 r.

The fourth edition of this book did not differ much from the th [M.A. **5**–385], but the fifth is a large-sized handsome volume profus illustrated and with five beautiful coloured plates. The order and c tents of the chapters are the same as in the previous edition, but text is considerably amplified. A glossary of technical terms and a n indicating the principal mineral localities in the Soviet Union are add The book provides a fascinating account of minerals and rocks in th scientific and industrial aspects and, although designed for childr makes good reading for more mature minds and even for specialists.

S. I. T

Putnam (William C.) & Webb (Robert W.). *Laboratory exercises physical geology.* Stanford Univ. Press & London (Oxford Un Press), 1938, 81 pp., 6 figs. Price 4*s.* 6*d.*

In four sections—mineralogy, petrology, structural geology, a geomorphology—are given scraps of potted information, often rat obscurely expressed as half-truths, which may be readily misund stood by students. For example, of crystals 'six systems are gover by six laws', and plagioclase has 'nearly perfect right-angle cleavag Many of the pages are blank forms for exercises. The wire-hin booklet is not likely to be used outside the authors' own classes.

L. J. S

Topographical Mineralogy.

Ahlfeld (Friedrich) & Muñoz Reyes (Jorge). *Mineralogie von Boliv* Berlin (Borntraeger), 1938, vii+89 pp., 1 pl., 30 text-figs. Pr RM. 10.50.

This German edition is a slightly abridged translation of the Span 'Mineralogia Boliviana' intended for use in the mining school at Or

in Bolivian high schools. It is a first attempt at a collected account
ne many interesting minerals found in Bolivia, several of which are
liar to this highly mineralized region. Descriptions are given of
species (or groups) ranging from diamond (a few crystals of which
been found in tributaries of the Beni river) to albertite. In addition
formation collected from the literature, many new occurrences are
ded. A useful index of localities gives the province and department
hich each is situated. Some important localities appeared to be
ing, but these were found under *ch* in the order of the Spanish
abet. A bibliography includes 75 papers. Owing to the publication
sty work in preliminary papers there are several unfortunate errors
he recent literature; e.g. ahlfeldite = cobaltomenite, blockite =
oseite, brickerite = austinite, kolbeckine = herzenbergite, pufah-
= zinc-teallite = teallite; and some other species need confirmation.
par appears as 'peldspat'. L. J. S.

MAN (A. E.) & BOHNSTEDT [= BONSHTEDT] (E. M.). *Minerals of the Khibina and Lovozero tundras.* (Brief contents of papers composing the Russian monography under the same title.) Moscow & Leningrad (Lomonosov Inst. Acad. Sci. USSR), 1937, 152 pp., 60 figs. Price 17 r. 50 k.

outline is given of the geology and petrography with descriptions chemical analyses of 111 mineral species from this region in the peninsula. [M.A. **3**–235; **4**–180; **5**–34; **6**–307–12, 341–3.]

L. J. S.

UND (Alois). *Die Minerale Niederösterreichs.* 2nd edition, Wien & Leipzig (Franz Deuticke), 1937, xi+247 pp., 11 figs. Price RM. 8 (bound RM. 10.40).

is edition shows an increase of 53 pages on the first edition of 1909. ives descriptions of about 130 mineral species found in Lower ria. Most of these occur in granite and crystalline schists and in s intersecting these rocks. There is a useful index of localities.

L. J. S.

SON (Edward S.). *Contributions to the mineralogy of Western Australia. Series X.* Journ. Roy. Soc. W. Australia, 1937, vol. 23 (for 1936–37), pp. 17–35, 4 figs. [Cf. M.A. **5**–491, **6**–362.]

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) Almandine, Marvel Loch, Central Division.—Small crystals of et from different rocks gave analyses: I and II from graphitic mica-

schists, III hornblende-schist (probably derived from eclogite), pegmatite. (2) Anthophyllite from Mt. Palmer and Marvel Loch Dikes of an almost pure anthophyllite-rock with little tremolite specks of chromite and magnetite gave V from Marvel Loch, VI Palmer. (3) Chlorite, Mt. Satirst, NW. Div., and Kalgoorlie.—Comp greenish-black material from Mt. Satirst gave VII, indicating aphr derite with 65·1 mol. % daphnite; α 1·681, β and γ 1·684. Green black vermicular chlorite in cavities in a quartz vein from Kalgoo gave VIII, indicating metachlorite with 60·0 mol. % daphnite; α 1·6 β and γ 1·662. In both these chlorites the pleochroism is α pale yell β and γ rich green. (4) Chloritoid from Mt. Magnet, Murchison Div Analysis is given of a mica-schist containing minute disks of chlorit (5) Columbite and manganocolumbite, McPhee's Range, NW. Div A chart gives the percentages of Nb_2O_5 and Ta_2O_5 from the spec gravity (pure columbite 5·20, tantalite 7·90). Actual specimens fr alluvial and pegmatite concentrates have sp.gr. 5·21–7·80, with 3·26–15·99 %. On crystals 14 forms are noted. (6) Dufrenite, Gin SW. Div.—A band of bright-green earthy dufrenite occurs in glaucon sand above a clay band. It has been derived from marcasite or py and coprolites. (7) Elbaite, Ravensthorpe, SW. Div.—Pink (anal. sp. gr. 3·00–3·02, ω 1·637, ϵ 1·619), green (X, sp. gr. 3·02–3·04, ω 1·6 ϵ 1·619), and black tourmaline from pegmatite with spodumene, lepi lite, montebrasite, &c. The green material usually envelops a core pink, rarely milk-white, tourmaline. (8) Gahnite, Goyamin Pool, S Div.—Small green grains, occurring with staurolite, fibrolite, &c. quartzite, gave Al_2O_3 57·72, ZnO 29·46, FeO 8·88, MnO 0·02, MgO 2· SiO_2 1·08 = 99·95, sp. gr. 4·38. (9) Grossular.—Beautiful crystals (*d* of brown garnet from quartz veins in amphibolite near Melville, Murchi Division, gave XI. Pale pink to pale brown masses in a quartz vein Meier's Find, Central Division, gave XII, n 1·740. Analysis is g given of a garnet-hornstone from Toodyay, SW. Division. (10) Haem tite (hydrohaematite), Inglehope, SW. Div.—Hollow nodules of limo have an inner mamillary layer with brilliant lustre; analysis X suggests a pseudomorph of haematite after goethite with some halloy and gibbsite. (11) Pisanite, Ravensthorpe, SW. Div.—Walls and timb in the abandoned Surprise gold mine are coated with thin crystall crusts and small stalactites of greenish-blue pisanite, notable in conta ing cobalt; SO_3 28·52, CuO 13·09, FeO 11·00, NiO 0·16, CoO 0· MgO 0·97, CaO 0·27, Al_2O_3 0·39, SiO_2 0·11, H_2O (in desiccator) 14· H_2O (diff.) 30·69 = 100·00, sp. gr. 1·95.

SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	H_2O+	Total.	Sp.gr.
36·22	0·08	20·38	3·26	27·57	6·40	1·93	4·40	nil	100·24	4·17
36·44	0·72	21·70	0·61	32·89	0·49	4·03	2·08	0·87	99·83	4·16
39·44	1·04	19·08	2·05	27·90	3·91	1·72	4·34	n.d.	99·48	4·15
36·20	n.d.	20·76	1·08	27·19	13·34	1·22	0·56	nil	'100·30'	4·20
57·60	0·09	1·90	1·56	5·45	0·31	26·35	1·60	4·22	100·43	(2·81)
52·31	0·23	3·95	3·26	5·37	0·16	26·39	3·17	4·57	100·65	2·94
21·17	0·07	20·02	9·88	33·48	0·45	3·10	0·10	10·63	99·65	3·18
23·32	0·03	17·45	4·09	38·90	0·01	4·45	0·24	10·89	100·27	3·10
39·07	—	41·25	—	0·19	0·54	0·10	0·29	—	—	—
37·92	—	39·18	—	2·14	1·34	0·40	0·22	—	—	—
40·08	0·58	13·18	11·16	1·74	0·34	0·06	32·68	trace	99·82	3·62
39	—	25	0·5	—	—	1·5	34·5	—	—	3·55
0·41	—	1·26	96·86	—	0·19	—	—	1·73	100·45	4·48

also Na_2O 0·01, K_2O 0·04, Cr_2O_3 0·57, FeS 0·07, H_2O- 0·66. VI, also Na_2O K_2O 0·06, Cr_2O_3 0·31, CO_2 0·05, H_2O- 0·70. VII, also Na_2O 0·06, K_2O 0·12, – 0·57. VIII, also K_2O trace, H_2O- 0·80. IX, also Li_2O 1·28, Na_2O 2·32, K_2O X, also Li_2O 1·24, Na_2O 2·64, K_2O 0·42. L. J. S.

L (E.). *Titanite, allanite e gadolinite isotropa del granito di Baveno.* Atti Soc. Ital. Sci. Nat. Museo Civico, Milano, 1937, vol. 76, pp. 384–388.

hene as small blue crystals on orthoclase is pleochroic from sky- (γ) to colourless. Allanite shows forms *a c d n s i* [Dana's letters], , (80$\bar{9}$), (10$\bar{4}$), and (10$\bar{5}$). Gadolinite, black and shining with con- al fracture and greenish-grey streak; isotropic, *n* 1·790–1·795, r. 4·12. L. J. S.

sso (Teresa). *I minerali dei filoni pegmatitici di Olgiasca.* Atti Soc. Ital. Sci. Nat. Museo Civico, Milano, 1937, vol. 76, pp. 403–418, 5 figs.

enty species of minerals described from the pegmatite of Olgiasca, Como, Lombardy, include chrysoberyl, uraninite, repossite, beryl, n, &c. Garnet, with the forms *d n o s y* [Dana's letters] and new .3), has *d* 4·24, *n* 1·804, and gave analysis SiO_2 34·75, Al_2O_3 23·08, $_3$ 5·61, FeO 22·16, MnO 7·28, MgO 6·71, CaO 0·90 = 100·49, sponding with Al 53·90, Py 24·42, Sp 16·23, Ad 8·45. Tourmaline ack crystals with a new form ($\bar{1}\bar{3}$.4.3) has *d* 3·184, ω 1·655, ϵ 1·631, gave analysis SiO_2 35·11, B_2O_3 10·90, Al_2O_3 33·97, FeO 10·56, 5·63, CaO 0·62, Na_2O 2·27, K_2O 0·18, H_2O+ 0·81, H_2O- 0·08, = 100·13. L. J. S.

NER (H.). *Neue Mineralfunde in den österreichischen Ostalpen. VII.* Mitt. Naturwiss. Ver. Steiermark, 1937, vol. 74, pp. 40–44, 1 pl.

—— Ibid., pp. 46–56. [Cf. M.A. **6**–506.]

A continuation (nos. 70–71, 83–93) of previous notes. Mitt. Landesm Joanneum, Abt. Bergbau, Geol., Graz, Heft 1, which was to cont article VII, did not appear. L. J. S

Meixner (Heinz). *Zwei neue alpine Pyrophyllitvorkommen; das A treten dieses Minerals in den Alpen.* Zentr. Min., Abt. A, 19 pp. 117–120.

Pyrophyllite, with β 1·588, 2V 61–62°, occurs in a graphitic seric schist from the Wolfendorn, Pfitsch valley, southern Tyrol; and w kyanite and ankerite in a quartz vein from the Königsstuhl, Stub valley, Salzburg. At a few other Alpine localities the mineral is usu associated with lazulite. L. J. S

Tokody (László). *Adatok a Szepes-Gömöri Érchegység ásványai ismeretéhez.*—Tokody (L.). *Beiträge zur Kenntnis einiger Mineral des Szepes-Gömörer Erzgebirges (Ungarn).* Mat. Term.-tud. Értes Budapest, 1936, vol. 54, pp. 650–671 (Hungarian), pp. 672– (German summary), 7 figs.

Tourmaline, as black crystals (*a r o*), intergrown with quartz, ch bite, calcite, and rarely tetrahedrite, from Ötösbánya, com. Sze Arsenopyrite, with tetrahedrite, chalcopyrite, quartz, and chalyb from Felsőszalánk, com. Szepes, shows the forms *c* β ρ *u t n q e m* [Da letters], (027), and new (019), (038); analysis by G. Vavrinecz g S 21·93, As 42·37, Sb trace, Fe 34·18, Ni 0·05, Co 0·43, Cu 0 Pb 0·24, insol. 0·55 = 100·53. Chalcopyrite from Rozsnyó, com. Gön shows *c p p*, *g z* (102), (605), (11.0.9), (504), (905), (17.0.9), (23.0. and new (305), (31.0.32), (20.0.11), (13.0.7), (15.0.8), (32.0.15), (4 the crystals are of two types: (1) with *p* predominating; (2) *p* and *z* large, and many pyramids of the second order. Baryte as tr parent crystals on limonite from Rozsnyó, tabular on *c*, with the fo *a b c* λ *m* χ *o z f*, and new (970). Hyalite from Vashegy, com. Gömö birefringent with *n* 1·480. Gypsum as transparent crystals, *a b v d m* from Vashegy. Rhodochrosite, as raspberry-red crystals, 3½–5 m from Gömörrákos, Gömör [M.A. **3**–508], show only (21$\bar{3}$1). V.

Mauritz (Béla). *A halápi és gulácsi bazalt hólyagüregeiben keletk ásványok.*—Mauritz (B.). *Die Mineralien der Blasenräume Basalt vom Haláp und Gulács (Plattenseegebiet).* Mat. Term.- Értesítő, Budapest, 1937, vol. 55, pp. 923–937, 8 figs. (Hunga with German summary.)

RITZ (B.). *Die Mineralien in den Hohlräumen der Basalte von Haláp und Gulács im Plattenseegebiete (Ungarn).* Min. Petr. Mitt. (Tschermak), 1938, vol. 50, pp. 93–106, 8 figs.

escriptions are given of the following minerals from vesicles in the lt of Mt. Haláp and Mt. Gulács, Lake Balaton: stilbite, thaumasite, ondine, phillipsite, natrolite, mesolite, scolecite, chabazite, andesine-dorite, sanidine, augite, ilmenite, magnetite, biotite, apatite, cal- aragonite, and opal. V. Z.

ÓKAY (Kálmán). *Néhány ásvány Gyöngyösoroszi ból.*—SZTRÓKAY (K. v.). *Einige Mineralien von Gyöngyösoroszi (Mátragebirge, Ungarn).* Földtani Közlöny, Budapest, 1938, vol. 68, pp. 30–32. (German with Hungarian summary.)

ydrothermal veins in pyroxene-andesite of middle Miocene age ain the following minerals: galena, blende, fluorite, dolomite, tz, amethyst, pyrite, and baryte. V. Z.

GROVE (A. K.). *Mines and mineral resources of Newfoundland.* Newfoundland Geol. Survey, 1938, Information circular no. 4, vii+162 pp., 22 pls., 22 text-figs.

escriptions are given of occurrences of economic minerals, some of h have been mined, the most important being ores of Fe, Cu, Zn, and fluorite, and in smaller amounts Au, Ni, and chromite. An x of localities with the minerals found at each is given. L. J. S.

SWORTH (H. V.) & JOLLIFFE (F.). *Some recently-discovered minerals of the Great Slave Lake area, N.W.T.* Univ. Toronto Studies, Geol. Ser., 1937, no. 40, pp. 71–81, 4 pls.

ndalusite is abundant in metamorphosed pre-Cambrian argillaceous ments and in quartz-pegmatites. It is often altered to muscovite on outside and sometimes contains a core of blue corundum. Anal. I inkish glassy andalusite from Yellowknife Bay area; II (also O 0·03, K_2O 0·22) of brownish-red material from Outpost Islands; with α 1·629, β 1·633, γ 1·639. The andalusite-bearing quartz-natite contains ferberite (WO_3 74·50, FeO 23·02, MnO 0·49 %, &c.) some sulphide ores.

SiO_2	TiO_2.	Al_2O_3.	Fe_2O_3.	MnO.	MgO.	CaO.	H_2O+	H_2O-	Total.	Sp.gr.
36·86	0·04	61·46	0·60	<0·01	0·22	0·20	0·64	0·08	100·11	3·137
36·58	0·05	60·16	1·82	<0·01	0·16	0·22	0·86	0·08	100·19	3·139

L. J. S.

Thomson (Ellis). *A review of the occurrence of tellurides in Cana* Univ. Toronto Studies, Geol. Ser., 1937, no. 40, pp. 95–101.

Lists are given of the localities of telluride minerals with referen to the literature since 1890. Altaite, hessite, petzite, and tetradym are the most frequent, next come calaverite and sylvanite, wh coloradoite, krennerite, melonite, nagyagite, native tellurium, a tellurium ochre are scarce. L. J. S

Crawford (Wm. P.). *Tellurium minerals of New Mexico.* Amer. Mi 1937, vol. 22, pp. 1065–1069, 1 fig. (map).

Details are given of the occurrence of ten tellurium minerals in sev counties in SW. and N. New Mexico. L. J. S

Quinn (Alonzo) & Young (John A. *Jr.*). *Minerals and associated ro at Copper Mine Hill, Rhode Island.* Amer. Min., 1937, vol. pp. 279–289, 2 figs. (maps).

Veins of copper ore were worked in the 18th century in the townla of Cumberland near the contact of riebeckite-granite intruded i green-schists with beds of quartzite and crystalline limestone. So account is given of the several minerals found on the old dumps. L. J. S

Richmond (W. E. *Jr.*). *Paragenesis of the minerals from Bluebe Mountain, Woburn, Massachusetts.* Amer. Min., 1937, vol. pp. 290–300, 6 figs.

The magmatic sequence (granodiorite, granite, aplite, and pegmati was followed by different periods of hydrothermal activity with formation of later minerals (allanite, orangite, babingtonite, &c.) in pegmatites and in veins. Well-shaped crystals of prehnite are s under the microscope to be built up of sectors. L. J. S

Pegau (Arthur A.). *Mineralogy of the Virginia diabase.* Amer. M 1937, vol. 22, pp. 872–874.

Of the 47 minerals recorded, 38 have been found in diabase intru into Triassic sediments, these including several hydrothermal miner 23 in diabase intruded into Palaeozoic and pre-Cambrian igneous metamorphic rocks; and 18 in that intruded into Palaeozic sedime which are farthest from the original source. L. J. S

GOMERY (Arthur). *The epidote localities of Prince of Wales Island, Alaska.* Rocks & Minerals, Peekskill, N.Y., 1937, vol. 12, pp. 195–08, 8 figs.

ERSON (E. P.). *Mineralogical explorations in southeastern Alaska.* Explorations & Field-work, Smithsonian Inst., for 1936, 1937, pp. 11–14, 6 figs.

interesting narrative of a collecting trip in 1936. Seams of epidote in garnet-rock with copper ore (mined in 1900–1918) at the contact tamorphic limestone and igneous rock. Large prismatic crystals dote were collected on Copper Mt., and tabular crystals on Green ter Mt., together with large Japanese twins of quartz. L. J. S.

ARÃES (Djalma). *Jazida de minerio sulfurado do Morro do Bule, Hargreaves, Ouro Preto.* Bol. Serv. Geogr. Geol. Minas Gerais, 1934, no. 2, vi+26 pp., 1 map, 14 pls. Price 3$000.

leposit of sulphide ore has been worked on a small scale near the eaves railway station, between Burnier and Ouro Preto, and es the only zinc ore in Brazil. Knots and stringers of the ore along the bedding of a band of dolomite in phyllites of the Minas . Stibnite and tetrahedrite were first deposited and later blende yrite. Gangue minerals are quartz, dolomite, and aragonite, and dary minerals are jamesonite, valentinite, bindheimite, and stibi-. Crystals of valentinite show the forms (110), (010), (122), (065) = 0·3938:1:0·4344]; refractive indices were determined through sm (110) for five wave-lengths: 2·32971 (670·8$\mu\mu$), 2·35810 (589·6), 53 (550·0), 2·38737 (435·1), 2·43433 (480·0) [but which index, not ; cf. M.M. **14**–328; M.A. **7**–160]. The tetrahedrite, as rough crystals 2 cm. across, is unusual in containing much lead and nickel; analy-ve: S 30·36, Sb 20·91, Bi 0·42, Cu 23·14, Pb 14·76, Ni 3·02, Fe 1·07, 91, SiO_2 0·49, CaO 2·07, MgO 1·37 = 98·52. L. J. S.

New Minerals.

LBUT (Cornelius S., *Jr.*). *Aminoffite, a new mineral from Långban.* Geol. För. Förh. Stockholm, 1937, vol. 59, pp. 290–292, 1 fig.

is is G. Flink's 'undetermined mineral no. 494' [M.A. **3**–442]. l ($\frac{1}{2}$–1 mm.), clear and colourless crystals are present in veins and ies in massive magnetite and limonite with calcite, fluorite, and te. The bipyramidal crystals, (111), (001), are tetragonal with = 1:0·7116, and poor (001) cleavage. Sp. gr. 2·94, H. $5\frac{1}{2}$, ω 1·647,

ϵ 1·637; a 13·8, c 9·8 Å., space-group D_{4h}^{17}. The mineral is infusible
insoluble in acids. Analysis by F. A. Gonyer, SiO_2 42·49, Al_2O_3 4
BeO 6·20, Fe_2O_3 0·31, MnO 0·19, CaO 40·27, H_2O 6·45 = '100·33', gi
$Ca_8Be_3AlSi_8O_{28}(OH)_3.4H_2O$, three of these molecules in the unit
The mineral is compared with meliphane. L. J. S

Björling (Carl Olof) & Westgren (A.). *Minerals of the Varutr pegmatite. IX. X-ray studies on triphylite, varulite, and their oxi tion products.* Geol. För. Förh. Stockholm, 1938, vol. 60, pp. 67–

Triphylite and its alteration products, ferri-sicklerite [M.A. **6**–485] heterosite, are orthorhombic with space-group D_{2h}^{16} and structures sim to that of olivine [M.A. **5**–322]. The unit cells contain four molecu

				a.	b.	c(Å.).	V(Å
Triphylite	...	...	$Li(Mn'',Fe'')PO_4$	4·711	10·374	6·038	29
Ferri-sicklerite	...	...	$Li(Mn'',Fe''')PO_4$	4·787	10·086	5·939	28
Heterosite	...	...	$(Mn''',Fe''')PO_4$	4·760	9·680	5·819	26

Varulite [M.A. **6**–486] and Mn-alluaudite, corresponding to triphy and ferri-sicklerite with Na in place of Li, have a structure differ from these; and *Na-purpurite* $(Mn''',Fe''')PO_4$, the end-product alteration in this series, is different again with a more complex structu L. J. S

Quensel (P.). *Minerals of the Varuträsk pegmatite. X. Spodumene its alteration products.* Geol. För. Förh. Stockholm, 1938, vol. pp. 201–215, 1 fig.

—— & Berggren (Thelma). —— *XI. The niobate-tantalate gro* Ibid., pp. 216–225, 1 pl.

Rosén (O.) & Westgren (A.) —— *XII. On the structure and composi of minerals belonging to the pyrochlore-atopite group and an X- analysis of disintegrated stibio-microlite.* Ibid., pp. 226–235. M.A. **6**–485–7; **7**–10, 108.]

Spodumene occurs as large (over $1\frac{1}{2}$ m.) opaque milky white crys (anal. I) and rarely as semi-transparent wine-yellow material (anal. and is usually altered to clayey materials (anal. III–VI by T. Berggr III and IV are referred to cimolite; V to kaolin; and VI, called *s killinte*, is a mixture of Na-spodumene, cimolite, halloysite, and il *Na-spodumene* is a presumed base-exchange product of spodumene Na in place of Li.

SiO_3.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	Na_2O.	K_2O.	Li_2O.
64·34	27·01	0·24	0·00	0·01	0·00	0·00	1·04	0·08	7·00
64·89	26·74	0·57	0·04	0·01	0·00	0·00	0·05	0·16	7·12
54·71	20·65	0·95	0·33	0·05	3·41	1·55	0·29	2·18	0·28
60·21	16·95	0·95	0·33	0·04	3·37	1·12	0·48	2·82	0·45
44·08	33·77	1·27	1·11	0·02	1·79	0·50	0·27	0·88	0·53
47·05	17·66	1·56	9·51	0·07	6·65	0·00	6·04	0·19	0·13

H_2O+.	H_2O-.	Cl.	P_2O_5.	Total.	Sp. gr.	α.	β.	γ.
0·24	0·07	—	—	100·03	3·130	1·661	1·666	1·676
0·48	0·06	—	—	100·12	3·163	1·661	1·666	1·676
7·17	8·77	0·03	0·03	100·40	2·205	1·537	—	1·544
5·62	7·69	0·01	0·04	100·08	2·383	1·522	—	1·534
11·94	3·32	—	0·36	99·84	2·533	1·543	—	1·556
8·90	2·47	—	0·00	100·23	2·431	—	—	—

greyish semimetallic mineral found in the pegmatite near the ontite locality [M.A. **6**–487] gave on analysis Ta_2O_5 52·3, Nb_2O_5 Sb_2O_3 25·3, Bi_2O_3 0·10, SiO_2 1·38, Al_2O_3 0·50, Fe_2O_3 0·26, MnO CaO 5·32, Na_2O 1·50, H_2O+ 1·11, H_2O- 0·16 = 99·81; sp. gr. . Microscopical and X-ray examination shows this to be a mixture of tantalite and microlite, $3[Sb_2(Ta,Nb)_2O_8]+2[Ca_2(Ta,Nb)_2(O,OH)_7]$, some antimony and senarmontite. The original mineral (not found) led *stibiomicrolite*, and the formula $(Sb,Ca)(Ta,Nb)(O,OH)_4$ is ted. Anal. VII of columbite, VIII manganocolumbite, and IX notantalite, which occur in small amounts as irregular masses lattened crystals.

Nb_2O_5.	Ta_2O_5.	TiO_2.	SnO_2.	SiO_2.	Al_2O_3.	FeO.	MnO.	Total.	Sp. gr.
61·30	13·60	1·07	3·14	1·16	1·20	10·70	8·52	100·69	5·623
61·00	17·80	0·76	0·76	0·00	—	5·62	13·50	99·44	5·460
3·00	74·00	0·73	0·00	1·14	—	9·81	10·79	99·47	—

e stibiotantalite mentioned above is orthorhombic with a 4·92, , c 11·78 Å., space-group C^9_{2v}, and 4 $[Sb'''TaO_4]$ in the unit cell. It morphous with Sb_2O_4 ($= Sb'''Sb^{v}O_4$). The microlite is cubic with 40 Å., and has the same structure as Sb_3O_6OH ($= Sb'''Sb^{v}_2O\ OH$) . **7**–86]. A discussion of the composition of substances with the pyro-e-atopite-microlite type of structure leads to the general formula $_6(O,OH,F)_6(OH,F,O)_z$, where X = Ca, Na, Sb''', Ag, and Y = Nb, Sb^{v}. [M.A. **5**–185.] L. J. S.

DYREVA (A. M.) & EGOROVA (E. N.). Болдырева (А. М.) и Егорова (Е. Н.). Индерит—новый водный борат магния. [*Inderite—a new hydrated borate of magnesia.*] Мат. ЦНИГРИ, Общ. сер., 1937, В. 2 [Mat. Central Sci. Investig. Geol. Prospecting Inst., General ser. no. 2].

[Boldyreva (A. M.)] Болдырева (А. М.). Исследование индерит вмещающей его породы.—Boldyreva (A. M.). *Investigation inderite and of the including rock.* Зап. Всеросс. Мин. Общ. (M Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 651–671 (Russian), p. (English summary), 10 figs.

Inderite, $2MgO.3B_2O_3.15H_2O$, occurs as small, white to pinkish, r form nodules in a compact red clay near Inder lake, western Kazakst The acicular (pseudo-orthorhombic) crystals have β 1·388, γ 1·504, large, negative, $\gamma:c = 5°$; sp. gr. 1·79. Analyses gave B_2O_3 35·60 (36· MgO 14·34 (14·65), CaO 1·02 (0·16), Al_2O_3 0·10 (0·02), Fe_2O_3 0·23 (0· Na_2O+K_2O 0·18 (0·17), SiO_2 0·71 (0·13), CO_2 0·38 (0·17), H_2O 48 (48·20), total 100·76 (100·02). The heating curve and X-ray patt show relations to those of inyoite [$2CaO.3B_2O_3.13H_2O$]. The red c contains quartz, calcite, hydrated basic magnesium carbonate, a hydroboracite. L. J. S

[Godlevsky (M. N.)] Годлевский (М. Н.). Очерки по минерало боратовых месторождений Индерского района.—Godlevs (M. N.). *Mineralogical investigation of the Inder borate depos* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937. ser. vol. 66, pp. 315–344 (Russian), 6 pls., 11 text-figs., pp. 345– (English).

A rich deposit of borate minerals was discovered in 1934 near the In salt lake, 150 km. north of the Caspian Sea and east of the Ural ri in western Kazakstan [M.A. **6**–366]. They occur in lenticles and nod with clays and residual anhydrite in the gypsum capping of a la (250 sq. km.) salt dome in Lower Permian strata; also in the underly salt beds (halite and sylvine) and in the Quaternary surface depos Analyses and optical data by A. M. Boldyreva: I, Hydroborac $CaMgB_6O_{11}.6H_2O$; α 1·522, β 1·534, γ 1·571, 2V 60°, positive, $\alpha:c$ = II, Ulexite, $NaCaB_5O_9.8H_2O$; α 1·496, β 1·505, γ 1·519, 2V 78°, posit $\beta:c$ = 2–4°. III, Inyoite, $Ca_2B_6O_{11}.13H_2O$; α 1·492, β 1·505, γ 1· 2V 84° negative. IV, Colemanite, $Ca_2B_6O_{11}.5H_2O$; α 1·586, β 1· γ 1·614, 2V 56°, positive, $\gamma:c$ = 84°. V, Pandermite, $Ca_5B_{12}O_{23}.8·5H$ α 1·574, β 1·585, γ 1·593. VI, *β-Ascharite*, $MgHBO_3$; α 1·575, β 1· γ 1·646, 2V small; these optical data [M.A. **6**–472] differ from thos the original ascharite from Germany (α-ascharite) and the X-ray patt is distinct from that of camsellite [M.A. **1**–375], suggesting three p morphous forms. *Inderite* [preceding abstract]. All have been deri from the hydroboracite, but the primary borate mineral is not kno

B_2O_3.	CaO.	MgO.	Al_2O_3.	Fe_2O_3.	Na_2O.	K_2O.	H_2O.	Insol.	Total.	Sp.gr.
49·22	13·86	9·93		0·06		0·12	26·59	0·10	99·88	2·14
41·99	14·12	0·11		0·07	6·08	0·14	36·95	0·25	99·71	1·91
36·57	20·34	0·08		0·07		0·09	43·00	0·04	100·19	1·82
49·92	27·37	0·10	0·06	0·01		0·10	22·73	0·07	100·45	2·44
48·50	32·41	0·11	0·08	0·04		0·10	18·52	0·08	99·93	2·47
40·85	nil	46·70	0·16	0·13	0·20	0·26	11·27	0·20	100·59	2·64

also MnO, Cl traces, SO_2 0·09. V, also MnO, Cl traces, SO_3 0·09. VI, also MnO Cl 0·11, SO_3 0·69.

L. J. S.

ky (G. B.)]. Бокий (Г.Б.). Кристаллографическое исследование боратов Индерского месторождения.—Boky (G. B.). *Kristallographische Untersuchung der Borate des Indersky-Fundortes.* Изв. Акад. Наук СССР, Отд. Мат. Ест., Сер. Хим. (Bull. Acad. Sci. URSS, Cl. Sci. Mat. Nat., Ser. Chim.) 1937, pp. 871–881 (Russian), pp. 882–883 (German), 7 figs.

niometric and optical measurements are given of borate minerals Inder, Kazakstan [M.A. **6**–366, 472], Ulexite, α 1·495, β 1·505, 20, 2V 79°, positive. Colemanite, $a:b:c = 0{\cdot}7768:1:0{\cdot}5417$, $\beta =$ 1′, fourteen forms include new *e* ($\bar{3}02$) and *z* ($\bar{6}21$); α 1·585, β 1·593, 1, 2V 55°, positive. Inyoite, $a:b:c = 0{\cdot}8807:1:0{\cdot}6979$, $\beta =$ 0′, forms *a* (100), *b* (010), *c* (001), *m* (110), *q* ($\bar{2}01$), *p* (111), *r* ($\bar{1}11$),), *h* (011), *l* (112), cleavage (001), (010); α 1·489, β 1·505, γ 1·519, , negative. Pandermite, α 1·574, β 1·584, γ 1·594, biaxial negative. reboracite, $a:b:c = 1{\cdot}762:1:1{\cdot}241$, $\beta = 77°\,21'$, forms *a* (100), *b* (010), , *m* (110), *p* (111), cleavage (100), (010); α 1·522, β 1·535, γ 1·572, °, positive. Ascharite, α 1·576, β near γ, γ 1·646, biaxial negative. ite, β 1·488, γ 1·505, 2V large, negative, $\gamma:c = 5$–7°. L. J. S.

ock (M. A.) & Bandy (M. C.). *Ungemachite and clino-ungemachite: new minerals from Chile.* Amer. Min., 1938, vol. 23, pp. 314–328, 10 figs.

ll details of a paper previously published in abstract [M.A. **6**–443]. ungemachite 32 crystal-forms are listed; space-group C_{3i}^2. The ula is $Na_4(K,Fe''')_2OH(SO_4)_3.5H_2O$ [not (SO_3) as previously mis-ed]. Clino-ungemachite, indistinguishable in appearance from nachite, was found only as six minute pseudo-rhombohedral als showing 24 forms with some relation to those of ungemachite, ts chemical and physical characters could not be determined.

L. J. S.

Fester (G. A.), Cruellas (J.), & Gargatagli (F.). *La "magallanita" un nuevo mineral bituminoso.* Anal. Soc. Cient. Argentina, 1 vol. 124, p. 211.

A hard asphaltum is thrown up by the sea on the coast of Magalla Its formation is suggested to be due to the action of salt-wate petroleum. L. J.

Dunicz (Bolesław Ludwik). *Untersuchungen über den Thiocelat* Chemie der Erde, 1938, vol. 11, pp. 576–589, 6 figs.

Additional details with analyses of the distillate and portions tracted by various solvents. [M.A. **6**–344.] L. J.

Brendler (Wolfgang). *On the identity of austinite and bricke* Amer. Min., 1938, vol. 23, pp. 347–349.

A new analysis of 'brickerite' from Lilli mine, Lomitos, Bol [M.A. **5**–200, **6**–344], gave As_2O_5 42·48, Sb_2O_5 0·53, CaO 21·12, ZnO 30 Fe_2O_3 0·69, MnO 0·12, H_2O+ 3·47, H_2O- 0·12, insol. 1·11 = '99·9 another sample gave As_2O_3 42·95 % and no antimony; sp. gr. 4·13–4 H. 4–4½. The optical data are also in agreement with those of austi [M.A. **6**–53]. The name austinite has priority. L. J.

Precious Stones.

Rau (Wilhelm). *Die Edelsteine.* Leipzig (J. J. Weber), 1937, 32 16 col. pls. Price 90 Pf.

This is no. 27 in the 'Weberschiffchen-Bücherei' series of pop booklets issued at a low price. A general account of four pages is lowed by brief descriptions of various gemstones under their min logical names, Diamant, Korund, &c. But under quartz we find 'Zit or 'Quartztopas.' The gaudy coloured plates are rather crude, and cut stones and crystals cast curious shadows. L. J.

Webster (Robert). *The gemmologist's pocket compendium.* Wit foreword by L. J. Spencer. London (N. A. G. Press), 1937, 143 pp., 12 figs. Price 5*s*.

This small and handy volume for quick reference contains a us compilation of definitions and data. All minerals that have been as gemstones are included. In addition to the 143 pages of text there 61 pages of advertisements, which also spread out on the covers. price harmonizes with those of gemstones. L. J.

ER (Carl). *Edelsteine. Wie sie beschaffen sind und wie wir sie einkaufen sollen.* Erlenbach, Zürich (Schweizer Warenkunde), 1936, 8 pp., 18 pls. 29½×21 cm. Price Fr. 4.50.

s pamphlet issued by the Union of Swiss Goldsmiths (Verband izer Goldschmiede) gives a good summary account of precious s extracted from K. Schlossmacher's third edition of Max Bauer's steinkunde' [M.A. 5–193]. The information thus has a minera- l basis. Special attention is paid to the similarity in appearance of ent stones, and to the confusion that arises by not adhering to alogical names for species. The unfortunate gem names 'bixbite' apyrite' should have been avoided. The four attractive coloured s of cut stones painted by W. Wild are from Eppler's book 6–5], and the two plates of famous diamonds from that of P. Aloisi 6–4]. Other plates illustrate different forms of cutting and objects by Swiss goldsmiths. Under kunzite, G. F. Kunz [1856–1932] is ed to be of Swiss origin. L. J. S.

AN (J.). *Het onderzoeken van edelsteen.* Chem. Weekblad, Amsterdam, 1937, vol. 34, pp. 496–501, 2 pls.

account of the methods employed in the Netherlands Institute for vestigation of gemstones in the Rijksmuseum at Leiden.

L. J. S.

ELL (David H.). *Identification of certain gem-stone materials by their mission spectra.* Amer. Min., 1937, vol. 22, pp. 796–802, 1 fig.

red faceted stone with d 3·61, n 1·716, might be either garnet or . These can be distinguished by a spectrographic analysis made out 0·1 mg. of material removed with a diamond point from a back close to the girdle. The method affords a means of distinguishing ent jade-like minerals and also tourmaline and andalusite, with the ice of very little material. L. J. S.

T (Julius). *Examination of precious stones by means of their fluorescence in ultra-violet light.* Analyst, 1937, vol. 62, p. 731.

e fluorescent effects of various stones are noted. L. J. S.

ER (W. Fr.). *Die Ideal-Schleifformen durchsichtiger Edelsteine.* Zentr. Min., Abt. A, 1938, pp. 1–5, 2 figs.

able is given of the angles and relative proportions for faceted

stones ranging in refractive index from 2·42 to 1·54 (diamond to qu
for giving the maximum reflection from the back facets. [M.A. 3–
L. J.

Eppler (W. Fr.). *Die wirtschaftliche Entwicklung der Edelstein-
Diamantindustrie von Idar-Oberstein.* Fortschr. Min. Krist. P
1937, vol. 22, p. xxxviii.

A brief calendar of the principal events in the development of
gem-cutting industry at Idar-Oberstein since 1600. L. J.

Walcott (Albert J.). *Asterism in garnet, spinel, quartz, and sapp
Field Mus. Nat. Hist. Chicago, Geol. Ser., 1937, vol. 7, no. 3, pp.
57, 7 figs. Price 50 *c.*

Specimens of garnet and spinel which show asterism contain enclos
of fine elongated crystals parallel to the axes of symmetry. The ch
yant bands of light seen (on cut spheres and cabochons) are on g
circles perpendicular to these axes. According to the axes involved t
may be several arrangements in the number of chatoyant bands and
number of rays (4- or 6-rayed stars) at their intersections. Six-ra
stars at the pole of the *c*-axis in corundum and in a specimen of c
colourless quartz are ascribed to diffraction from internal striae du
oscillatory growth between prism and pyramid faces. L. J.

The Diamond News. Kimberley, 1937, vol. 1→. Monthly numb
price 6*d.*

This new periodical is devoted to popular articles and trade note
the diamond industry. No. 1 appeared in October 1937. A serie
articles 'Diamondiferous alluvial gravels' is by Alex. L. Du Toit.
L. J.

Grodzinski (Paul). *Diamant-Werkzeuge: Darstellung der Anwend
des Diamanten in Industrie und Gewerbe.* Berlin (M. Krayn), 1
214 pp., 130 figs. Price RM. 4.90.

Detailed accounts are given of the technical uses of diamond as p
supports, gauges, hardness testers, cutting, boring, and grinding tools
L. J.

Tromnau (Hans-Werner). *Licht- und Doppelbrechung einiger ge
gelbgrüner und brauner Diamanten.* Neues Jahrb. Min., Abt
1937, Beil.-Bd. 73, pp. 309–326, 2 figs.

Determinations of refractive index of yellow, yellow-green, and br

nt-cut diamonds by the prism method for light of several wave-
as gave in isotropic stones n 2·4168–2·4178, mean 2·4169, for
n-light, the highest value being for a dark brown stone. Bire-
nt stones gave n 2·4163–2·4186 and birefringence 0·0007–0·0016,
extreme values being noted in different directions in a single rose-
coloured stone. L. J. S.

ER (Kenneth S.). *The heat capacity of diamond from 70 to 300° K.* ournal. Chem. Physics (Amer. Inst. Physics), 1938, vol. 6, pp. 68–70, fig.

specific heat (C_p cal./deg.) of diamond at −203° C. is 0·0224 . . . at 1·355. Differences between observed and calculated values are ssed. L. J. S.

GUPTA (T.). *The distribution and probable source of diamonds in Bundelkhand.* Quart. Journ. Geol. Mining and Metall. Soc. India, 1935, vol. 7, pp. 81–89, 2 pls.

mond occurs along a narrow belt extending about 40 miles ENE. Panna town. It is mined in conglomerate and in the derived allu-eposits. One bed of conglomerate forms the base of the Rewa series, nother, higher up, the base of the Bhander series. They contain s of red jasper, green quartzite, vein-quartz, and shale, and were bly derived from the granite area east of the Ken river. L. J. S.

ES (Luciano Jacques de). *Depositos diamantiferos no norte do Estado de Minas Geraes.* Bull. Serviço de Fomento da Producção Mineral, Brasil, 1934, no. 3, 77 pp., 30 pls.

ailed accounts are given of the geology and occurrence of diamond eral localities in the north of Minas Geraes. [M.A. **5**–276.] L. J. S.

ARDOS (Othon Henry). *Diamante e carbonado no Estado da Bahia.* Avulso Serviço de Fomento da Producção Mineral, Brasil, 1937, no. 19, 21 pp., 8 pls.

general account of the history and geology and occurrence and ng of diamond in Bahia, with a bibliography. L. J. S.

ETT (J. D.). *The diamond deposits of Sierra Leone.* Bull. Imp. Inst. London, 1937, vol. 35, pp. 333–348, 1 pl., 2 text-figs.

o small crystals of diamond were found in January 1931 in the ls of the Gbobore stream in the Kono district, east central portion

of the Colony. Later finds were made along other tributaries of Bafi and Sewa rivers, and in 1936 the output was valued at £500. Two small crystals have also been found farther south in the Ker district, in a tributary of the Moa river. The rocks of the region are Cambrian(?) granites invading schists and intruded by dolerite. diamonds are often found in crevices in the bedrock, but the gravels in places yielded up to 250 carats per cubic yard. They range from 12 to the carat up to a stone of 144 carats, and include green stewartite, and framesite. Crystals are usually octahedra, less dodecahedra, and rarely cubes. Associated minerals in the gravel corundum, zircon, ilmenite, epidote, rutile, garnet, and occasionally s and chrysoberyl, these being common to the granite-schist contac much-fractured pyrope is restricted to the diamond area. L. J.

Dollar (A. T. J.). *Fractures in synthetic corundum.* Gemmologist, don, 1938, vol. 7, no. 79 *in* Goldsmiths Journ., vol. 37, pp. 553–8 figs.

Three types of fracture are distinguished. (1) Conchoidal, on sur along which the 'boules' most commonly split longitudinally, per parallel to $(10\bar{1}0)$. (2) Planar, probably parting planes $(10\bar{1}1)$ and (0 (3) Columnar, due to a columnar structure seen only in artificial sap [M.A. **6**–497]. This fragility of the 'boules' is due to internal s (which is shown also by optical anomalies), probably due to too r cooling. L. J.

Tromnau (Hans-Werner). *Chemische und physikalische Untersuchu an synthetischen mit Kobalt gefärbten Spinellen.* Neues Jahrb. Abt. A, 1934, Beil.-Bd. 68, pp. 349–376, 1 pl., 4 text-figs.

Artificial spinels prepared by the Verneuil process from $MgO.3\frac{1}{2}A$ with varying amounts of Co_3O_4 (up to 50 % Co) contain less cobalt (20·3 % Co) and generally less Mg than is present in the raw mat The cobalt is probably present as $CoAl_2O_4$ in isomorphous mixture $MgO.xAl_2O_3$. The specific gravity and refractive index increase an hardness decreases with increase in the amount of cobalt. Temper 850° C. for 24 hours corundum separates from those spinels conta little cobalt, but not from those with much cobalt. Absorption sp are given. [M.A. **4**–70.] L. J.

Leinz (Viktor) & Leonardos (Othon Henry). *Notas sobre as es aldas da fazenda das Lages, Itaberahy, Goyaz.* Avulso Serviç Fomento da Producção Mineral, Brasil, 1936, no. 13, 14 pp., 4

xagonal prisms of emerald-green beryl found in alluvial deposits probably been derived from the talc-schist of the Serra das Lages, ich it is suggested the mineral was of pneumatolytic origin. The ls are much flawed and contain inclusions of dolomite, talc, rutile, e, liquid, and gas. Pleochroism is weak, ω emerald-green with a of yellow, ϵ emerald-green with a tinge of blue. Spectroscopic sis shows the presence of Si, Al, Be, and traces of Cr, Ni, V, Ti, Mg.

L. J. S.

L (Philipp). *Optische Untersuchungen am Smaragd und einigen nderen durch Chrom gefärbten Mineralien.* Neues Jahrb. Min., Abt. A, 1934, Beil.-Bd. 68, pp. 401–438, 13 figs.

fractive indices (determined for several wave-lengths), density, and rption spectra of emeralds show small differences for material from ent localities and depth of colour. The absorption spectra of al and artificial rubies are identical, but different from that of red coloured by chromium. Spinel with excess of γ-Al_2O_3 is coloured by Cr_2O_3, but becomes red on tempering. Artificial corundum and coloured green by vanadium give an absorption spectrum similar at of the artificial spinel coloured green by chromium.

L. J. S.

ERSON (B. W.) & PAYNE (C. J.). *Identification of synthetic emerald.* Gemmologist, London, 1938, vol. 7, no. 78 *in* Goldsmiths Journ., vol. 37, pp. 407–410, 4 figs. [Further notes, ibid., vol. 7, no. 81 *in* vol. 38, pp. 103–106.][1]

synthetic emerald developments. Gems and Gemology, Los Angeles, California, 1937, vol. 2, pp. 131–134, 7 figs.

tention is again drawn to the slight unessential differences between e and artificial emerald [M.A. **6**–195, 200, 497]. The density, ctive indices, and birefringence (of which some new determinations iven) are slightly lower in the artificial material. [It is well known these characters vary with the chemical composition between rather limits in the different varieties of beryl.] L. J. S.

[1] The Gemmologist [M.A. **5**–53, **6**–198], issued monthly in octavo form from st 1931 to July 1937 (vols. 1–6, nos. 1–72), has now been merged in the trade al, Goldsmiths Journal, issued monthly in quarto form. The Gemmologist n is numbered from vol. 7, no. 73, but the pagination is that of the whole al, which runs from vol. 36 to vol. 38 (1937–8). The result is a triplication pagination in vol. 7.

Leitmeier (Hans). *Das Smaragdvorkommen im Habachtal in Salz*
und seine Mineralien. Min. Petr. Mitt. (Tschermak), 1937, vol
pp. 245–368, 11 figs. [Cf. M.A. **5**–488.]

Emerald occurs in biotite-schist, rarely in talc-tremolite-actinc schist, at the junction of gneiss and amphibolite. Analysis, SiO_2 6 Al_2O_3 17·25, Cr_2O_3 0·12, Fe_2O_3 0·71, BeO 13·07, MgO 0·84, CaO Na_2O 1·42, K_2O 0·14, H_2O 2·97 = 100·84, sp. gr. 2·749, does not c spond with the usually accepted formula $Be_3Al_2Si_6O_{18}$. The sp. gr. (2· 2·758) and refractive indices (ω 1·5790, ϵ 1·5740 Na for a pale stone, ω 1·5819, ϵ 1·5769 for a dark stone) are compared with the dat emerald from other localities. The associated minerals and rocks described and their origin discussed. The occurrence is similar to th the Urals. L. J.

[Borovsky (I. B.) & Blokhin (M. A.)] Боровский (И. Б.) и Бло (М. А.). Рентгенографическое исследование метамиктного тояния цирконов.—Borowsky (I. B.) & Blochin (M. A.). *X-*
examination of the metamict state of some zircons. Труды Ломон Инст. Геохим. Крист. Мин. Акад. Наук СССР (Trans. Lomono Inst. Geochem. Cryst. Min. Acad. Sci. USSR), 1936, no. 7, 197–205. (Russian with English summary.)

Zircons of low specific gravity from Ceylon and Karelia were subje to X-ray study. Some of them were found to be in a metamict [M.A. **3**–261] with destroyed lattice and with ZrO_2 and SiO_2 (tridy replacing zircon molecules. S. I.

[Kostyleva (E. E.)] Костылева (Е. Е.). О причине колеба удельного веса у цирконов.—Kostyleva (E. E.). *On the* *of specific weight devergences* [sic] *of zircons.* Труды Ломон Инст. Геохим. Крист. Мин. Акад. Наук СССР (Trans. L nossov Inst. Geochem. Cryst. Min. Acad. Sci. USSR), 1936, 7, pp. 207–224. (Russian with English summary.)

The study of zircons from Ceylon suggests that those of low sp gravity are in a metamict state. These products of alteration of z consist of a mixture of ZrO_2 and SiO_2, and are distinguished unde name of zirconoids (sp. gr. 3·9–4·2, H. 6–7, refr. index about 1·76). M con, cyrtolite, and other similar varieties are not zirconoids but ar products of isotropization of zircons. S. I.

ELBERG (M. v.) & CHUDOBA (K.). *Dichte und Struktur des Zirkons*
I. Zeits. Krist., 1937, vol. 97, pp. 252–262.

DBA (Karl F.). *Optical properties, density, and structure of zircon.*
emmologist, London, 1937, vol. 7, no. 76 *in* Goldsmiths Journ.,
ol. 37, pp. 193–196, 7 figs. [Cf. M.A. **6**–498, 499.]
ircon crystal with density 3·972 consisted of amorphous SiO_2 and
crystalline cubic ZrO_2. Another of density 3·945 consisted of
hous SiO_2 and amorphous ZrO_2, but the ZrO_2 crystallized when
rystal was heated to 900° C. Experiments were made on other
s whose density was less than the normal 4·7, but their behaviour
ot found capable of easy interpretation. H. H.

DBA (K.). *Isotropisierung und Rekristallisation im Zirkon.* Fortschr.
Min. Krist. Petr., 1937, vol. 22, pp. xxxii–xxxv.
ropized zircon of low density consists of a mixture of amorphous
nd amorphous ZrO_2, and is a paramorph (metamict?) after the
l zircon. When heated at 1450° C. the material recrystallizes as
with the normal density and refractive indices. L. J. S.

RSON (B. W.). *Recent work on zircon.* Gemmologist, London, 1937,
ol. 7, no. 73 *in* Goldsmiths Journ., vol. 36, p. 506; (no. 74), pp. 611–
12, 1 fig.; (vol. 7, no. 75), vol. 37, pp. 96–103.
RSON (B. W.) & PAYNE (C. J.). *Recent work on zircon.* Ibid., 1937,
ol. 7, no. 77 *in* ibid., vol. 37, pp. 297–301.
mmary of recent papers [M.A. **6**–498, 499, and preceding abstracts].
ourth article contains a number of new determinations of the den-
nd refractive indices of zircons from various localities. L. J. S.

DBA (Karl F.), translated by B. W. ANDERSON. *Hardness and*
ensity of zircons. Gemmologist, London, 1938, vol. 7, no. 79 *in*
Goldsmiths Journ., vol. 37, pp. 548–549, 1 fig.
con of *d* 4·68 from Mongka, French Indo-China, tested on the
ometer is harder (H. $7\frac{1}{2}$) than quartz, and slightly harder $\perp$ than $\parallel$
s. Zircon of *d* 3·97 from Ceylon is about as hard (H. 6) as felspar.
L. J. S.

z (Joachim). *Beitrag zur Frage der Zirkone niedriger Dichte.* Zeits.
Krist., 1937, vol. 98, pp. 201–210, 3 figs.
nomalous density of zircon is explained by the fact that, while the
ty of zircon proper is 4·7, zircon of lower density is a mixture of

zircon with normal structure and an amorphous material. In ext cases the amorphous substance forms almost the whole of the min When the low-density zircon is strongly heated, it is converted normal zircon. H.

Jakob (J.). *Über die Anwesenheit von reduziertem Zirkonium in den konen.* Schweiz. Min. Petr. Mitt., 1937, vol. 17, pp. 154–163.

Analyses of zircons: I, brown bipyramids in soda-syenite-pegm from Alter Pedroso, Portugal; formula '$6SiO_2.3ZrO_2.1Na_2O$'. II, crystals in pegmatite from Cliou, Valpelline, Piedmont. III, ye fairly clear crystals from Miask, Ilmen Mts., Russia. IV, colourless zircon from Ceylon; formula '$10SiO_2.5Zr_2O_3.1Na_2O$'. Assuming Z the totals of analyses II–IV become 99·75, 100·05, 100·03.

	SiO_2.	ZrO_2.	Fe_2O_3.	Na_2O.	K_2O.	H_2O+.	H_2O-.	Total.	Sp
I.	45·96	46·57	0·74	6·26	0·16	0·47	0·00	100·16	3
II.	29·66	70·88	3·84	n.d.	n.d.	n.d.	n.d.	104·38	
III.	30·62	69·00	1·24	2·56	0·64	0·39	0·08	104·53	4
IV.	32·33	68·85	—	2·37	0·83	0·12	0·00	104·50	4

[Na_2O and sp. gr. of I suggest albite; but no Al_2O_3!] L. J.

Brandenberger (E.). *Röntgenographische Untersuchungen an chem anomalen Zirkonen.* Schweiz. Min. Petr. Mitt., 1937, vol. 17 164–168.

X-ray powder photographs of the analysed zircons (preceding abst gave for III a 6·60, c 5·99 Å., close to the values previously obta [Min. Mag. **21**–176; M.A. **3**–432, 528]. A similar result was shown with the addition of albite lines. IV gave a confused pattern sugge a metamict condition. Assuming 14 oxygen atoms in the unit cell formula is given as $Zr_2Si_2O_7 = Zr_2O_3.2SiO_2$. L. J.

Lacroix (Alfred). *La nature du gisement de zircon du Mont Ampo à Madagascar.* Compt. Rend. Acad. Sci. Paris, 1937, vol. 205 1333–1336.

The main zirconiferous rock occurs as veinlets in granitic dissog with associated gneiss and schists. It consists of microcline, andes and a little quartz, and crumbles easily at the outcrop, liberating zircons in the form of large crystals, up to 12×8 cm. and weig several kg., grey or rosy in colour, d 4·590. They are usually isolated sometimes occur interlaced, and bent or fractured. Other acce minerals are diopside, hornblende, grossular, sphene, and apatite. lets of milky quartz 10–20 cm. thick occur in which are calcite, trem fluorite, and an occasional zircon. There are also veins of pegmatite

dark crystals of zircon, violet fluorite, and much quartz. The disso-
es have resulted from the action of pneumatolytic emanations from
ranite on the surrounding calciferous rock. Three analyses of non-
iferous dissogenites are given. C. A. S.

ER (E.). *Über die frühere Edelsteinseife von Hinterhermsdorf (Sächs.
chweiz)*. Fortschr. Min. Krist. Petr., 1937, vol. 22, pp. lviii–lix.
all (1 mm.) crystals of zircon of a fine hyacinth colour and ceylonite
formerly (about 1720) collected from eluvium derived from basalt-
L. J. S.

HER (Walther). *Ist eine Ausbeutung der fast vergessenen sächsischen
Vorkommen von Topas und Achat heute wirtschaftlich möglich?*
Fortschr. Min. Krist. Petr., 1937, vol. 22, pp. xxxix–xli.
e pale wine-yellow topaz from the Schneckenstein in Vogtland was
ed between 1729 and 1797; since 1800 this rock pinnacle has been
ural monument. Other stones formerly worked in Saxony are:
agate from Halsbach, Freiberg; agate and amethyst from Schlott-
Müglitz valley; amethyst from Weisenbad, Wolkenstein; smoky-
z from Zinnwald [Bohemia]; and riband-jasper from Gnandstein,
en. L. J. S.

r (Adolf). *Garnets from vesicles in rhyolite near Ely, Nevada*. Amer.
Min., 1938, vol. 23, pp. 101–103.
k red crystals (211) on quartz lining vesicles have sp. gr. 4·26,
·824, *a* 11·531 Å., and gave analysis SiO_2 36·28, Al_2O_3 21·27, Fe_2O_3
FeO 29·46, MnO 11·96, MgO 0·14, CaO 0·53 = 99·88, corresponding
$RO:R_2O_3:SiO_2 = 2·82:1:2·87$, and Al 69·3, Sp. 28·5. L. J. S.

MSDORFF (Wolf Eckehart). *Das Verhältnis der Anzahl der Links-
quarze zu der Anzahl der Rechtsquarze in einer größeren Menge von
Quarzkristallen. Untersuchungen an Quarzen, die aus den beiden
enantiomorphen Quarzarten aufgebaut sind und Untersuchungen an
Amethysten*. Neues Jahrb. Min., Abt. A, 1937, Beil.-Bd. 72, pp. 464–
495, 6 pls., 6 text-figs. Reprints as Inaug.-Diss., Göttingen, 1937.
a collection of 4483 quartz crystals from veins and cavities in
tone from Villa Cristallina, Goyaz, Brazil, 2219 were right-handed,
left-handed, and 41 Brazil twins of right- and left-handed. The
igures and figures of growth on right- and left-handed crystals are
bed. Amethyst crystals are invariably twinned on the Brazil law,
onsist of a lamellar intergrowth of quartz and amethyst in zones and

sectors with 2V up to 32°. This amethyst substance, as distinct f quartz, contains up to 0·1 % BPO_4 isomorphous with Si_2O_4, and it higher refraction and birefringence (ω 1·5448–1·5432, ϵ 1·5539, ϵ 0·009152) and lower density (d 2·6496) than quartz (ω 1·5442, ϵ 1·5 $\epsilon-\omega$ 0·009123, d 2·6506). The colour of amethyst is due to free B an atoms, and of smoky-quartz to Si atoms. L. J. S

[Dravert (P. L.)] Драверт (П.). Хризопраз в Карагандинс области Казахстана.—Drawert (P.). *Das Chrysopras im K ganda-Gebiet Kazakstans.* Академику В. И. Вернадскому пятидесятилетию научной и педагогической деятельности, Ак Наук СССР [V. I. Vernadsky jubilee volume, Acad. Sci. USS 1936, vol. 2, pp. 827–831 (Russian), p. 832 (German summary)

Large blocks of chalcedony and hornstone coloured green by ni salts are found in gravels near Borovoe on the NNW. slopes of the S Adyr range. The chrysoprase and nickel silicate minerals have origin by the decomposition of serpentinized peridotites. L. J. S

Rogers (Austin F.). *Lapis lazuli from San Bernardino County, C fornia.* Amer. Min., 1938, vol. 23, pp. 111–113, 1 fig.

A lapis-lazuli rock from Cascade Canyon is a haüyne-bearing diops muscovite-gneiss grading into a gneissoid limestone with dark la rich in haüyne and sprinkled with pyrite. Qualitative tests of the mineral indicate that the sulphate molecule predominates over sulphide molecule and that it is a sulphide-bearing haüyne. This is the case with lapis-lazuli from other localities, and the name laz is unnecessary. L. J.

Crawford (Wm. P.) & Johnson (Frank). *Turquoise deposits of C land, Arizona.* Econ. Geol., 1937, vol. 32, pp. 511–523, 2 figs.

Gem turquoise occurs with limonite, kaolin, and sericite, in frac zones in Cambrian quartzite and post-Cretaceous granite at Court Cochise Co., where it has long been mined in open cuts and shafts depth of 180 feet. Analysis gave P_2O_5 29·22, Al_2O_3 29·22, copper iron 1·00 %. L. J.

Colour of Minerals.

[Fersman (A. E.)] Ферсман (А. Е.). Цвета минералов. [*The co of minerals.*] Москва-Ленинград, Акад. Наук СССР, Сер. нау популярная [Moscow-Leningrad, Acad. Sci. USSR, Ser. Popular], 1936, 159 pp., 1 col. pl., 9 text-figs. Price 5 r.

is 'popular' book will no doubt interest specialists as it gives an inating account of the colour of minerals in the light of modern ies of crystal-chemistry and geochemistry. The greater part of the consists of an exposition of the original ideas of the author. The ipal factors determining the colour of minerals are ionic charges ionic polarization of the component ions. The geochemical con- nces of this theory are fully discussed. The book is well printed and ins a coloured plate, list of literature, glossary, and an index.

S. I. T.

MAN (A. E.). *Études dans le domaine de la coloration des minéraux.* Compt. Rend. (Doklady) Acad. Sci. USSR, 1937, vol. 17, pp. 201–204.

e lowering of the colours of minerals (movement of the absorption towards the longer waves) is explained by the increased ionization e component ions. Thus, for example, the lowering of colour in -hornblende is attributed to the presence of trivalent iron and not t of sodium. Several other examples of minerals and chemical ounds are given. S. I. T.

ERAM (K.). *Absorption bands and electron transitions in coloured fluorites.* Nature, London, 1938, vol. 141, p. 970.

oured fluorites show two regions of strong absorption: 350–470 mμ c bivalent ions of the rare-earths; 530–650 mμ due to reduced cal- ions. Europium, with a blue absorption band, is the cause of the yellow colour of Derbyshire fluorite; samarium, with a red band, s a deeper yellow-brown colour (Wölsendorf). With both rare-earths calcium ions in various proportions green, blue, and violet colours t (Weardale). Changes in these colours and luminous effects, brought t by heat, light, and various radiations, can be attributed to the fer of electrons from the rare-earth ions to the calcium ions or vice a. L. J. S.

BE (Ernst). *Über die Färbung von Mineralien durch Mangan, Chrom und Eisen.* Neues Jahrb. Min., Abt. A, 1935, Beil.-Bd. 69, pp. 183–254, 24 pls.

bsorption spectra in visible rays are recorded in tables and curves large number of salts of Mn, Cr, Fe, and Ti of different valencies, r in solution or in the solid. These are compared with the absorption tra of various coloured minerals. Manganese gives a red colour ourmaline and it also has some effect in almandine. Chromium is

present in rhodochrome and kämmererite, red and artificial alexandr coloured spinel, alexandrite, blue kyanite, several emeralds, fuchs uvarovite, and green zircon. Ferrous iron gives a green in bottle-gl and chlorites; Fe″–Fe‴ gives the colour to vivianite, sapphire, bl green spinel, and green corundum; and Fe‴ colours carnelian.

L. J. S

Hoffmann (Josef). *Über photolytisch neutralisierte Elementarstoffe Fluorite.* Chemie der Erde, 1937, vol. 11, pp. 368–374.

White fluorite from Fürstenberg, Saxony, when exposed to radi became blue, and this colour disappeared in a few seconds on expos to light. The coloured material, powdered in the dark, gave an alkal reaction. Prepared CaF_2 did not show this effect. The colour is due free calcium atoms, and not to cerium oxides. Dark violet fluor associated with uranium minerals in Saxony and Bohemia is stron alkaline. The differences in smell noticed when this material is powde are due to F, HF, and O_3 (the last two formed by the action of F traces of H_2O).

L. J. S

Hoffmann (Josef). *Über Ionen- und Atomfärbungen künstlich hergest ter und natürlicher Apatite.* Chemie der Erde, 1938, vol. 11, pp. 5 575, 2 figs. [Cf. M.A. **6**–72, 265.]

Ferric and ferrous iron together produce a green colour in artificial a natural apatites; Mn gives green or blue (not red). Some other colo are due to rare-earths (cerapatite). Changes in colour produced by he light, and various radiations are described.

L. J. S

Postelmann (Alfred). *Die Ursache der Blaufärbung gesteinsbilden Quarze.* Neues Jahrb. Min., Abt. A, 1937, Beil.-Bd. 72, pp. 401–4 6 pls.

The blue colour of quartz seen in reflected light was examined erratic blocks from East Prussia (mostly derived from Finland): rapakivi granite blue quartz and smoky-quartz show a zonal arran ment. The blue quartz contains microscopic needles or hairs of ru with a thickness of 0·5–0·2 μ. The Rayleigh blue is due to the scatter of light in a colloidal turbid medium with particles of high refract index. The colour of smoky-quartz and rose-quartz is also attributed the presence of titanium. A review is given of the literature. L. J. S.

Jayaraman (N.). *The colour of the blue quartz of the charnockites of so India and of the opalescent quartz-gneiss of Mysore.* Current Scien Bangalore, 1938, vol. 6, pp. 381–383, 2 figs.

e coloured quartzes from the Kadur district are blue by reflected and yellowish by transmitted light. They are decolorized by heat 00° C. Micro-sections show acicular crystals of rutile or bands of inclusions, and a brownish-yellow turbidity. The intensity of the ation is proportional to the amount of titanium present (but not of); and the colour appears to be due to colloidal titanium present in urbid medium. Colourless quartz from other localities shows the kind of inclusions, but without the turbidity. L. J. S.

z (Joachim). *Über die Verfärbung des Zirkons durch Bestrahlung.* Zeits. Krist., 1937, vol. 97, pp. 337–353, 13 figs.

ue zircon cut as a gemstone becomes grey-brown on exposure to violet light, and recovers its blue colour when illuminated by le light. The author investigated this phenomenon quantitatively eans of the absorption spectrum. H. H.

DE RUBÍES (S.) & LÓPEZ DE AZCONA (J. M.). *Relación entre el color y la composición espectroquímica de la blende de Aliva (Picos de Europa).* Anal. Soc. Española Fís. Quím., 1937, vol. 35, pp. 180–186, 2 pls.

ctroscopic analyses of blendes of various colours suggest that the colour is due to Co (and Fe?); red to Sn, In, Ag, (and Mo); yellow Ga, Cu, Hg. Cd is present in all samples and may be the cause of ellow colour. L. J. S.

Artificial Minerals.

EY (George W.) & INGERSON (Earl). *The pneumatolytic and hydrothermal alteration and synthesis of silicates.* Econ. Geol., 1937, vol. 32, pp. 607–761, 11 figs.

detailed summary is given of the results, mostly qualitative, that been obtained in experiments in which silica and silicates were ed with water, &c., in an autoclave. Abstracts are given of 156 rs dating from 1845 to 1937, and indexes of the names of minerals of authors are appended. L. J. S.

GORIEV (D. P.)] Григорьев (Д. П.). Очерки успехов экспериментальной минералогии в СССР за годы *1917–1936*.—GRIGORIEV (D. P.). *Esquisses des progrès de la minéralogie expérimentale en l'URSS pour les années 1917–1936.* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 235–270 (Russian), pp. 271–305 (French), pp. 305–314 (bibliography).

This is the first review of this subject in USSR and it gives a very u
ful summary of the works on experimental mineralogy subdivi
according to subject-matter and provided with a bibliography of
items. S. I. T

[Lebedev (P. I.) & Belshterli (M. K.)] Лебедев (П. И.) и Бельште
(М. К.). Образование кристобалитовых сталактитов в Мартен
ской печи.—Lebedev (P. I.) und Bölsterli (M. K.). *Die Bild
von Christobalitstalaktiten im Martin'schen Ofen.* Труд. Петр. Ин
Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 19
no. 4, pp. 73–82, 3 figs. (Russian with German summary.)

An account is given of cristobalite stalactites formed on and fr
silica bricks in a Martin steel furnace. In their chemical composition
stalactites and the silica bricks are almost identical. S. I. T

[Belyankin (D. S.) & Kaznakova (N. G.)] Белянкин (Д. С.) и Казнак
(Н. Г.). К вопросу о кристобалите.—Beljankin (D. S.)
Kaznakova (N. G.). *On the question of cristobalite.* Труд. Пе
Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URS
1934, no. 6, pp. 361–368, 1 pl. (Russian with English summary

In silica bricks cristobalite occurs in two modifications: (1) sta
found along the working face of the brick and formed at a temperat
above 1470° C.: and (2) metastable, found in cracks of quartz crys
and often completely replacing them during the process of firing of
bricks (1300–1400° C.). The metastable cristobalite, which accordin
its optical properties (n 1·487–1·492) belongs to the low-temperat
modification (β-cristobalite), is optically isotropic. Similar isotr
cristobalite (n 1·487) is also found in opal from certain Mongolian qua
porphyries. S. I. T

Beljankin (D.) [= Belyankin (D. S.)]. *Das Dinasgesetz.* Centr. M
Abt. A, 1934, pp. 306–312, 2 figs.

Used silica bricks from a Martin steel furnace show four zones:
yellowish unaltered zone, with relict quartz, tridymite, and isotr
metastable β-cristobalite (preceding abstract); (2) dark reddish-br
transition zone with relict quartz, tridymite, and pseudo-wollaston
(3) black tridymite zone composed of tridymite and dark glass
fayalite, monticellite, and skeletal iron-ore; (4) light grey cristob
zone in which tridymite is transformed into a stable form of cristoba
The chemical analyses of the material of these zones show the en

of zone (2) in TiO_2, Al_2O_3, and CaO, and of zone (3) in Fe_2O_3, FeO, MnO. S. I. T.

N (V. V.)] Лапин (В. В.). Исследование химико-минералогических изменений в динасе из свода сталеплавильной электропечи Балтийского судостроительного завода.—Lapin (V. V.). *Investigations of chemical-mineralogical changes of dinas bricks of the vault of the steel melting electrical furnace of the Baltic ship-building plant.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1936, no. 7–8, pp. 235–256, 3 pls., 11 text-figs. (Russian with English summary.)

emical and microscopical studies of used silica bricks show that the mum concentration of Fe_2O_3, FeO, and MnO is found in the grey bbalite zone, and that of TiO_2, Al_2O_3, and CaO in the transitional nish zone. Cristobalite occurs in the form of dendrites and scaly gates. It is often intergrown with magnetite and brown crystals 74) of monticellite (?). Brown (n 1·684) and yellowish (n 1·673) is present in high-temperature zones. Fragments of quartz in the zone show cracks infilled with a colourless isotropic material 92), which is thought to be a variety of impure cristobalite. S. I. T.

ov (B. V.)] Иванов (Б. В.). Некоторые моменты службы огнеупоров на Мариупольском металлургическом заводе им. Ильича. —Ivanoff (B. V.). *Some moments of the work of dinas.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1936, no. 9, pp. 23–52, 12 figs. (Russian with English summary.)

ed silica bricks show the following maxima for concentration of s: in the cristobalite zone, MgO; in the tridymite zone, Fe_2O_3, MnO, CaO; in the transition zone, TiO_2; in the unaltered zone, $_3$. Tridymite (α 1·470, γ 1·474) is often found replacing quartz. obalite (α 1·484, γ 1·487) is found in the form of scaly and dendritic als. In a vitrified basic refractory brick, cristobalite was found in orm of scaly aggregates surrounded by dendrites. S. I. T.

yankin (D. S.) & Vinogradova (A. M.)] Белянкин (Д. С.) и Виноградова (А. М.). Об одном случае переноса SiO_2 в газовой форме (Из керамической практики).—Beljankin (D. S.) and Vinogradova (A. M.). *On a case of transfer of SiO_2 in gaseous form from ceramic practice.* Труд. Петр. Инст. Акад. Наук СССР (Trav.

Inst. Pétrogr. Acad. Sci. URSS), 1936, no. 7–8, pp. 5–6, 2 f
(Russian with English summary.)

A felt-like efflorescence of amorphous silica (n 1·450) has been obser
on the surface of fire-bricks in a ceramic furnace. It is explained a
case of gaseous transfer of silica under the influence of water vap
given out by the sawdust used in the manufacture of the bricks.
S. I. T

[Grigoriev (D. P.)] Григорьев (Д. П.). Физико-химическое иссле
вание гидрата закиси марганца (минералы: пирохроит и б
стрёмит).—Grigoriew (D. P.). *Physikalische Untersuchung*
Hydrats des Manganoxyds (*Mineralien: Pyrochroit und Beckström*
Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1934, ser
vol. 63, pp. 67–80, 11 figs. (Russian with German summary

The study of pyrochroite from Långban, Sweden, owing to the alte
nature of museum specimens, did not give any definite results. The
paration of the artificial manganese hydroxides was carried out in
autoclave according to the method of A. de Schulten. With H_2O be
19 % the hexagonal modification (tabular habit) is obtained at
temperatures. With H_2O above 19 %, above 80° C., the orthorhon
modification (bäckströmite) is stable, while below 80° C. only
hexagonal modification (prismatic habit) is stable. The heating cu
of the artificial hydroxide of manganese indicates the loss of wate
160–185° C. S. I. T

[Belyankin (D. S.) & Lapin (V. V.)] Белянкин (Д. С.) и Лапин (В.
Некоторые явления кристаллизации в нефелиновых стекла
Beliankin (D. S.) and Lapin (V. V.). *Some crystallization phenom*
in the nepheline classes [sic]. Труд. Петр. Инст. Акад. Наук С
(Trav. Inst. Pétrogr. Acad. Sci. URSS), 1936, no. 9, pp. 3
16 figs. (Russian with English summary.)

Nepheline glass is a commercial glass in the manufacture of wh
soda and sulphate are partly replaced by nepheline or nephel
syenite. Fragments of this glass containing relict crystals of nephe
were examined. Nepheline often shows vitrification with a deve
ment of comb-like structure along the edges or sieve structure. Radi
fibrous albite was occasionally found in the resorbed nepheline.
products of devitrification of the glass are represented by pseudo-wo
tonite and devitrite. Scaly cristobalite is found replacing quartz, w
dendritic cristobalite is formed in the glass. S. I.

ZBERG (A. S.)] Гинзберг (А. С.). Опыты по получению литого
муллита.—GINSBERG (A. S.). *Versuche zur Darstellung des Schmelz-Mullits.* Академику В. И. Вернадскому к пятидесятилетию
научной и педагогической деятельности, Акад. Наук СССР [Ver-nadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 1, pp. 585–601, 6 figs. (Russian with German summary.)

st mullite has been obtained by fusing (1) clay and corundum, (2) ite (or andalusite) and corundum, (3) red bauxite, (4) white siliceous ite. The last gave the most economical and satisfactory results.

S. I. T.

GORIEV (D. P.)] Григорьев (Д. П.). О зональности одного фторсодержащего силикатного сплава.—GRIGORIEV (D. P.). *Über die Zonalität einer fluorhaltigen Silikatschmelze.* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 118–123, 1 pl., 1 text-fig. (Russian with German summary.)

melt of composition SiO_2 50, Al_2O_3 10, CaF_2 20, MgO 12·5, K_2O 7·5, oling in a crucible, separated into three zones (from above down-s): (1) pyroxene, (2) amphibole and mica, (3) mica. This is explained e phenomenon of diffusion during crystallization and the reaction on between mica and amphibole. [Cf. M.A. 7–33.] S. I. T.

GORIEV (D. P.) & ISKYUL (E. V.)] Григорьев (Д. П.) и Искюль (Е. В.). Регенерация амфиболов из их расплавов при нормальном давлении.—GRIGORIEV (D. P.) und ISKÜLL (H. W.). *Die Regeneration der Amphibole aus ihrer Schmelze bei normalem Druck.* Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1936, ser. 2, vol. 65, pp. 232–240, 1 pl. (Russian with German summary.)

GORIEV (Dmitry P.) & ISKÜLL (Ellen W.). *The regeneration of amphiboles from their melts at normal pressure.* Amer. Min., 1937, vol. 22, pp. 169–177, 3 figs.

om a dry amphibole melt only pyroxene crystallizes out. Addition small amount of CaF_2 to the melt results in the crystallization of nibole. In this way pargasite from Ilmen Mountains, previously ed by D. S. Belyankin (α 1·614, β 1·622, γ 1·635, $\gamma:c$ 22°, 2V 70–75°, ive) gave rise, after fusion and cooling, to a holocrystalline fibrous nibole (α 1·586, β 1·590, γ 1·603, $\gamma:c$ 17°, 2V 55–60°, positive). The ence between the original and the regenerated mineral is explained e reduction and removal of iron, introduction of lime, replacement H by F, and possible vaporization of the alkalis. S. I. T.

[Toropov (N. A.)] Торопов (Н. А.). О фаялитовом шлаке Карабашск медеплавильного завода.—Toropow (N. A.). *Über die Faya schlacke des Karabaschwerkes.* Труд. Петр. Инст. Акад. Наук СС (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1933, no. 4, pp. 53– 2 figs. (Russian with German summary.)

A slag from a copper furnace, almost entirely composed of faya (72 %) and magnetite (17 %), is described. The recalculation of chemical analysis of the slag and the optical properties (α 1·830, γ 1·8 2V 49°, positive, $r>v$) of fayalite show that it is a pure orthosilicate iron. S. I. T

[Moskvin (A. V.)] Москвин (А. В.). Тефроит из древних шлак Moskwin (A. W.). *Tephroit aus vorzeitlichen Schlacken.* Тр Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. URSS), 1933, no. 4, pp. 45–51, 4 figs. (Russian with Gern summary.)

Tephroite (α 1·77, $\gamma-\alpha$ 0·046, 2V 58–60°, negative) as well-form crystals of early generation was found in ancient manganese-rich i slag in central Asia. The dominant mineral of the slag is a calciu tephroite (α 1·723, γ 1·759, 2V 64½°, negative). Minute and skele crystals are probably glaucochroite (α 1·699, $\gamma-\alpha$ 0·035, 2V 68°, ne tive). Complete isomorphism between Mn_2SiO_4 and Ca_2SiO_4 is postulat S. I. T

[Dilaktorsky (N. L.)] Дилакторский (Н. Л.). Об искусствен метасиликате марганца.—*On the artificial metasilicates of man nese.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétr Acad. Sci. URSS), 1934, no. 6, pp. 369–379, 1 pl., 7 text-f (Russian with English summary.)

An artificially prepared rhodonite (containing 3–8 % of tephroite SiO_2) has the following properties: melting-point 1310° C., sp. gr. 3·7 cleavage (001), (110), (1$\bar{1}$0), β 1·739, 2V 56°±3°, positive. S. I. T

[Grigoriev (D. P.)] Григорьев (Д. П.). Кристаллические фазы систе $NiO–SiO_2$.—Grigoriev (D. P.). *Crystalline phases NiO–S system.* Бюлл. Москов. Общ. Исп. Природ. (Bull. Soc. Nat. Mosc 1937, vol. 45 (Sect. Géol., vol. 15), pp. 149–153, 3 figs. (Russ with English summary.)

Mixtures of NiO and SiO_2 in various proportions fused with 3 % C yielded only NiO (bunsenite) as octahedra and dendrites, with n 2·4 Ni_2SiO_4 (nickel-olivine) as well-formed crystals, with α 1·976, β 1·9 γ 2·019; and tridymite. L. J. S

ANESE (Tullio). *Sulla bismutinite sintetica.* Periodico Min. Roma, 1936, vol. 7, pp. 1–17, 1 pl.

icular crystals, up to 15 mm. long, of Bi_2S_3 were formed by passing with HCl and CO_2 over Bi_2O_3 at 550°. Goniometric measurements $a:b:c = 0{\cdot}9879:1:1{\cdot}0660$, and eleven crystal-forms are noted.

L. J. S.

ANESE (Tullio). *Esperienze di minerosintesi.* (Nota preliminare.) Periodico Min. Roma, 1937, vol. 8, pp. 289–290.

passing H_2S or H_2Se with HCl over heated oxides, antimonis and seleniferous bismuthinite, jaipurite, guanajuatite, &c., were ined. The guanajuatite has the form of trigonal (not orthorhombic) s with angle *cr* 63¼° near to that of tetradymite. L. J. S.

BÒ (Luciano). *Sull'antimonite sintetica.* Periodico Min. Roma, 1937, vol. 8, pp. 291–300, 1 pl.

icular crystals, up to 15 mm. long and ½ mm. thick, of stibnite were red by passing H_2S and HCl over Sb_2O_3 at 450° C. They show ant iridescent colours and have the forms *a b h n m o q L* [Dana's s]. Measurements gave $a:b:c = 0{\cdot}9930:1:1{\cdot}0142$. L. J. S.

OLITO (E.). *Studio micrografico sull'antimonite e bismutinite sintetica.* Periodico Min. Roma, 1938, vol. 9, pp. 77–83, 1 fig.

stals of stibnite and bismuthinite prepared by Carpanese and bò (preceding abstracts) are identical in colour, pleochroism, and tive power with the natural minerals. Transparent yellowish-red les of stibnite give straight extinction proving that they are not oclinic. L. J. S.

WIN (H. E.) & LOMBARD (R. H.). *The system Cu-Fe-S.* Econ. Geol., 1937, vol. 32, pp. 203–284, 4 figs.

-Fe-S mattes crystallized just below the melting-point and at their very low dissociation pressure of sulphur are mixtures of Cu_2S and with considerable solid solution at the Cu_2S end, but very little at FeS end. Heated in sulphur vapour at higher pressures, sulphur is n up into solid solution as sulphur-rich chalcosine and pyrrhotine. rwards five ternary compounds are formed—$CuFeS_2$ (chalcopyrite), $_2S_3$ (cubanite), Cu_5FeS_4 (bornite), $Cu_3Fe_4S_6$, and Cu_5FeS_6. The erature-ranges and melting-points are determined. Pyrrhotine 5–1185° C. reacts with sulphur to form pyrite. Fifty-three tables of are given. L. J. S.

Peyronel (Giorgio). *Cristallizzazione della silice in $NaPO_3$.* Z
Krist., 1936, vol. 95, pp. 274–281.

The skeleton of silica formed on fusing amorphous silica with sod
phosphate consists of β-cristobalite at the temperature of fusion, 7
800° C., which changes to α-cristobalite on cooling. When the phosph
is replaced by sodium tungstate, the silica occurs in the form of tri
mite; but, if 2·8 % or more of the phosphate is added to the tungst
only cristobalite is obtained. A large excess of phosphate in the fu
mixture of silica and sodium phosphate gives rise to large crystal
$SiO_2.P_2O_5$. If silica is in excess, silicon pyrophosphate and cristoba
are obtained. H. E

Clark (G. L.) & Reynolds (D. H.). *Chemistry of zirconium diox
X-ray diffraction studies.* Indust. Engin. Chem. (Amer. Chem. So
1937, vol. 29, pp. 711–715, 4 figs.

Zirconyl hydroxide (precipitated from $ZrOCl_2$ solution) at 500
yields tetragonal ZrO_2, which at 600° C. is slowly transformed into
monoclinic form baddeleyite. This inversion is retarded in the prese
of SiO_2. L. J. S

Hägg (G.) & Söderholm (G.). *Die Kristallstrukturen von Mg-
Spinellen mit Al_2O_3-Überschuss und von γ-Al_2O_3.* Zeits. Physi
Chem., Abt. B, 1935, vol. 29, pp. 88–94, 2 figs.

An X-ray study of the spinels with excess alumina. The change of
side with increase in alumina has been determined; the pure MgA
has 8·056 Å. decreasing almost linearly with increase of Al_2O_3 to 7·98
for a spinel with 62·8 mols. % Al_2O_3. The solubility limit appears t
about 68 mols. % Al_2O_3, but may vary with temperature. The densi
of these spinels clearly show that the oxygen lattice remains undistur
metal positions being vacant in the Al_2O_3-rich crystals. γ-Alumin
the unstable end-member of this spinel series, having 1/9 of the m
lattice positions vacant. M. H. H

Škola (Václav). *O rozpadu mullitové fáze v žáru.* [On the decomposi
of the mullite phase at high temperatures.] Rozpravy České Ak
Cl. II, 1935, vol. 45, no. 17, 28 pp., 3 pls., 2 text-figs.

The influence of high temperatures (1400–1700° C.) on mullite
investigated. In the presence of alkalis (even only 1 %) decomposi
to corundum and a silica-rich glass takes place at 1400°. The presen
silica above the mullite ratio $3Al_2O_3:2SiO_2$ retards the decompositio
1500° or over. Mullite obtained by heating kyanite or fibrolite is n

cory than that prepared from the constituent oxides. The results onfirmed by X-ray analysis. F. S.

(George T.). *The fusion relations of iron-orthoclase. With a dis-ussion of the evidence for the existence of an iron-orthoclase molecule in ldspars.* Amer. Min., 1936, vol. 21, pp. 735–763, 7 figs.

ed $K_2O.6SiO_2$ glass dissolves Fe_2O_3 (13·5–21 %) giving iron-ortho-t 750–920° C. Over 920° this breaks down into iron-leucite (Fe_2O_3 75%), which in turn breaks down into haematite at 1050° C. The patterns are similar to those of the corresponding alumino-silicates. aematite enclosures in avanturine felspars are probably due to tion from ferriferous plagioclases. L. J. S.

ON (F. H.). *Accelerated weathering of feldspars.* Amer. Min., 1937, ol. 22, pp. 1–14, 6 figs.

ter drips over finely ground material contained in a porous cup O_2 in a sealed bomb. The soluble products are thus removed. clase yielded sericite at 280–320° C. Anorthite yielded pyrophyl-d calcite at 275° C. Albite is only slightly altered, yielding perhaps nite (?). L. J. S.

INI (Teresa). *Contributo allo studio della formula degli anfiboli e rosseni con ricerche di sintesi.* Atti Soc. Nat. Mat. Modena, 1936, ol. 67, pp. 19–30.

ing mixtures of SiO_2, Al_2O_3, $Fe(NH_4)_2(SO_4)_2.6H_2O$, MgO, and in various proportions at 1300° C. and cooling slowly, the following cts were obtained. I, yellow-brown flattened prisms with 2V 62°; I III, fibrous crystalline masses.

SiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MgO.	CaO.	H_2O.	Total.	Sp. gr.	α.	γ.
41·18	—	14·70	—	6·52	36·03	1·47	99·90	3·31	1·678	1·700
49·70	11·18	0·16	—	10·44	28·00	0·62	100·10	3·02	1·601	1·632
48·94	—	9·42	0·62	11·89	28·46	0·48	99·82	3·08	1·650	1·661

general formula is deduced for both amphiboles and pyroxenes, $_m(Si,Al)_4(O,OH)_{12}$, where X = Ca, K, Na, and Y = Mg, Fe‴, Al When $m = 0$ the formula is that of the orthorhombic pyroxenes; l, the amphiboles; $m = 2$, the monoclinic pyroxenes; $m = 3$, the etic product I; $m = 4$, wollastonite. L. J. S.

LER (E.) & HOFMANN (A.). *Mischkristalle $Mg_2Si_2O_6$–$LiAlSi_2O_6$ und Mg_2SiO_4–$LiAlSiO_4$.* Chemie der Erde, 1937, vol. 11, pp. 256–277, pls., 5 text-figs.

In the first of these systems, in which Mg_2 replaces LiAl, MgSiO clinoenstatite (d 3·175, γ 1·657–1·658, m.p. 1557°) with some lam intergrowth of enstatite, can take about 20 mol.% $LiAlSi_2O_6$ in s solution; and $LiAlSi_2O_6$, as α-spodumene (d 2·280, ϵ 1·5240–1·5 birefringence 0·005–0·007, uniaxial positive, m.p. 1380°), can take about 10 mol. % $MgSiO_3$; in the gap there is an eutectic at 1250°. In second system, Mg_2SiO_4, as forsterite (d 3·216, α 1·635, β 1·651, γ 1· 2V 85° 16′, m.p. 1890°), takes up about 30 mol. % $LiAlSiO_4$; $LiAlSiO_4$, as α-eucryptite (d 2·362, ω 1·527–1·531, uniaxial negat m.p. 1388°), takes up about 10 mol. % Mg_2SiO_4; in the gap ther a break down to Li-spinel and mixed crystals of clinoenstatite v α-spodumene, and an eutectic at 1270°. L. J. S

Thugutt (St. J.). *O syntetycznym kaliofilicie.—Sur la kaliophilite ficielle*, Arch. Min. Tow. Nauk. Warszaw. (Arch. Min. Soc. Varsovie), 1937, vol. 13, pp. 109–111 (Polish), pp. 112–113 (Fren

Kołaczkowska (Maria). *Badania rentgenologiczne naturalnego i sy tycznego kaliofilitu oraz jego pochodnych.—Études roentgenoscopi sur la kaliophilite et sur l'alunite naturelle et synthétique.* I pp. 92–95 (Polish), pp. 96–97 (French), 1 pl.

Kaolin heated for 72 hours at 205–209° C. in an aqueous solutio KOH with K butyrate yielded small spherules and minute hexag plates with the composition $K_2Al_2Si_2O_8$ and with refractive index X-ray pattern agreeing with kaliophilite. L. J. S

Thugutt (St. J.). *O newtonicie—produkcie przeobrażenia kaliofilitu.— la newtonite dérivée de kaliophilite.* Arch. Min. Tow. Nauk. Warsz (Arch. Min. Soc. Sci. Varsovie), 1937, vol. 13, pp. 80–88 (Pol pp. 89–91 (French), 1 fig.

Artificial kaliophilite ($K_2Al_2Si_2O_8$) heated for 70 hours at 208–21 in an aqueous solution of $KHSO_4$ yielded compact newtonite (Al $2SiO_2.4H_2O$) and crystalline alunite ($K_2O.3Al_2O_3.4SO_3.6H_2O$), toge with an intermediate product ($KHAl_2Si_2O_8$). L. J. S

Morey (G. W.) & Ingerson (Earl). *The melting of danburite: a stud liquid immiscibility in the system CaO–B_2O_3–SiO_2.* Amer. Min., 1 vol. 22, pp. 37–47, 3 figs.

Compounds are $CaO.2B_2O_3$, $CaO.B_2O_3$, $CaO.SiO_2$, and SiO_2, an large area of the triangular diagram is occupied by two immisc liquids, within which danburite ($CaO.B_2O_3.2SiO_2$) lies. At 1002° C. c

is slowly decomposed into two liquids; and it was not re-formed experiments. L. J. S.

N (N. L.) & SCHAIRER (J. F.). *The system albite-fayalite.* Proc. Nat. cad. Sci. U.S.A., 1936, vol. 22, pp. 345–350, 2 figs.

tures of albite (m.p. 1122°) and fayalite (m.p. 1205°) give an ic (m.p. 1050°) with 84 % albite. Occurrences of fayalite in vol- rocks are noted. L. J. S.

SSEN (H. zur). *Neuere Forschungen über Mehrstoffsysteme mit Eisenoxyden.* Fortschr. Min. Krist. Petr., 1936, vol. 20, pp. 238–289, 8 figs.

eview, with references to the literature, of fourteen systems Fe–O, SiO_2, FeO–P_2O_5, Fe_2O_3–SiO_2, Fe_2O_3–P_2O_5, and others with the ion of CaO, MgO, Al_2O_3, or Na_2SiO_3. L. J. S.

LE (G.) & MACHATSCHKI (F.). *Synthese des Alumopharmakosiderits; Formel und Struktur des Pharmakosiderits.* Fortschr. Min. Krist. Petr., 1937, vol. 21, pp. 77–78.

rystalline product was obtained by heating in a bomb at 250° C. recipitate from solutions of $Al_2(SO_4)_3$ and K_2HAsO_4. Most of this ible in HCl, but there remained small colourless cubes with tetra- faces and optically isotropic; sp. gr. about 2·8. Analysis of these ximates to the formula $Al_3(AsO_4)_2(OH)_3.5H_2O$, analogous to that armacosiderite. X-ray powder photographs gave a unit cell of a 7·75 Å. (for pharmacosiderite, a 7·94 Å., space-group T_d^1). This ould contain $1\frac{1}{2}$ of the above molecules, and the formula is perhaps $_3O_{12}(OH)_6.6H_2O$, for which a structure is suggested. L. J. S.

LSCHMIDT (Gunter). *A new calcium silicophosphate.* Journ. Chem. oc. London, 1937, pp. 865–867.

nute colourless grains isolated from an open-hearth basic slag are lly biaxial, positive, 2V very small, α 1·652, γ 1·1661; d 3·035. sis approximates to $7CaO.2SiO_2.P_2O_5$. The distinctive X-ray rn shows that this is not a mixture of silico-carnotite ($5CaO.SiO_2$. and $2CaO.SiO_2$. [Min. Mag. **19**–349.] L. J. S.

Economic Minerals and Ore-deposits.

OHR (Paul). *Fortschritte auf der Gebiet der Lagerstättenkunde.* Fortschr. Min. Krist. Petr., 1937, vol. 22, pp. 105–184, 2 figs.

A review of recent literature on magmatic ore-deposits with a bib graphy of 238 items. Intramagmatic, pegmatitic-pneumatolytic, hydrothermal deposits are distinguished in connexion with pluto rocks; and a few cases of deposits connected with volcanic rocks mentioned. Deposits of sedimentary and metamorphic origin will dealt with in a later report. L. J. S

Graton (L. C.). *Technique in mineralography at Harvard.* Amer. M 1937, vol. 22, pp. 491–516, 3 figs.

Details are given of the methods evolved at Harvard University the polishing of opaque ores and their examination under the mic scope. A parallel analogy is drawn between mineralogy and minera graphy and petrology and petrography [but petrography is not limi to opaque rocks]. [Cf. Min. Mag. **24**–595.] L. J. S

Fraser (H. J.) & Dreyer (Robert M.). *Mutual interference in microchemical determination of ore minerals.* Amer. Min., 19 vol. 22, pp. 949–976.

The influence of the presence of other elements was determined in micro-chemical tests of twenty elements and the results are tabulat L. J. S

Dadson (A. S.). *A potential series of some minerals from the Tim kaming district, Ontario.* Univ. Toronto Studies, Geol. Ser., 19 no. 40, pp. 115–150, 2 figs.

By etching polished specimens with solutions of silver salts and measuring the electrode potentials in acid solutions [M.A. **6**–227], minerals are arranged in the following series, commencing with the m electro-negative: (copper), breithauptite, niccolite and temiskam rammelsbergite, löllingite and safflorite, smaltite and chloanthite, sku rudite, (silver), gersdorffite, arsenopyrite, cobaltite. The deposition native silver in the ore is discussed. L. J. S

Meen (V. B.). *The temperature of formation of vein quartz and s associated minerals.* Univ. Toronto Studies, Geol. Ser., 1937, no. pp. 151–154.

Abstract of Ph.D. thesis and of previous papers [M.A. **5**–92, 226]. relation of some other ore minerals to high- and low-temperature qu is noted. L. J. S

DES (Kenneth K.). *Pegmatites and hydrothermal veins.* Amer. Min., 1937, vol. 22, pp. 551–560.

xtracts are given in some detail of the views of various authors since on the relations between pegmatites, quartz veins, and mineral s. Cases are quoted of the occurrence of workable deposits of ores n, wolfram, and molybdenum in pegmatites. These are in granite-natites. Most sulphide ore-minerals are connected with less acid nas (granodiorite, monzonite, diorite) of which pegmatitic equiva- are rare. It is suggested that here there is only a minor pegmatitic e before passing to the hydrothermal phase. L. J. S.

KHONTOV (N. P.)] Яхонтов (Н. П.). Классификация генетических типов графита.—JAHONTOV (N.). *Classification of genetic types of graphite.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1934, no. 6, pp. 29–44. (Russian with English summary.)

e author proposes a scheme of classification of graphite deposits odying: (1) the nature of the original material (inorganic, organic); he form of occurrence (vein, dessiminated, massive); and (3) the sis (syngenetic, epigenetic, metamorphic, metatetic, i.e. redeposited). S. I. T.

RDYUCHENKO (D. P.)] Сердюченко (Д. П.). Старокрымский графитоносный район. Петрологическое исследование.—SERDYUCHENKO (D. P.). *The Stary Krym graphite bearing region. A petrological study.* Всесоюзн. Научно-Иссл. Инст. Минер. Сырья (All-Union Sci. Research Inst. Econ. Min.), 1935, 123 pp., 10 pls., 9 text-figs. (Russian with English summary.)

aphite ore occurs in the form of lenses and segregations in a pre-brian gneiss of the Mariupol district [M.A. **4**–395, **6**–315]. It is usually ciated with a garnet-pyroxene-gneiss and the flakes of graphite are lly enclosed by or intergrown with other minerals of the gneiss. suggests a syngenetic origin of graphite from organogenic carbon-us sediments. The para-gneisses of the region were subsequently ted by acid magma with concomitant migmatization, and, at a later e, by aplite and pegmatite veins, which assimilated some of the ounding gneiss and the enclosed graphite. Nontronite [M.A. **4**–327] kaolinite are considered to be late products of weathering and their n may be attributed to the products of oxidation of graphite and

pyrite acting on the silicate minerals of the gneiss. A detailed petr graphical description of the rocks is supported by a number of analys S. I. T.

[Danov (A. V.)] Данов (А. В.). Об условиях образования месторо дений серы в Средней Азии.—Danov (A. V.). *On the origin of t sulphur deposits in Middle Asia.* Труд. Центр. Научно-Иссл. Гео Разв. Инст. (Trans. Central Geol. Prosp. Inst.), 1936, no. 88, pp., 2 pl. (Russian with English summary.)

The study of the Gaurdak (central Asia) sulphur deposits, and th comparison with other bedded sulphur deposits, suggests that sulph was formed in lagoons and relict lakes under the biochemical cont of micro-organisms. Primary sulphur deposits are often affected later diagenetic processes. A list of literature of 336 items is given. S. I. T.

Kupferburger (W.). *Corundum in the Union of South Africa.* Bu Geol. Surv. Union of S. Africa, 1935, no. 6, 81 pp., 2 maps. Price 6

This bulletin supplements the memoir of A. L. Hall [M.A. **1**–210]. T geology and mineralogy of the corundum deposits of the Union a summarized; there is little new matter under this head, but a use extension of the field north of Zoutpansberg is recorded for the fi time. The genesis of the corundum is still discussed in terms of t somewhat inadequate desilication theory; the hydrothermal theory Larsen is not mentioned. The bulletin gives valuable data regardi the mining, grading, and marketing of the mineral, and a summary its uses in industry. S. J. S.

Lapparent (Jacques de). *L'émeri de Samos.* Min. Petr. Mitt. (Tsch mak), 1937, vol. 49, pp. 1–30, 14 figs.

A collected account of previous papers [M.A. **5**–420, 526; **6**–15 The emery-rock (called samosite) consists largely of diaspore, deriv by the metamorphism of pisolitic bauxite, together with haemati magnetite, mica, &c. The contained 'taosite' is now described ilmeno-corundum or 'corindon ferro-titané', and the spinel is assum to be a titano-spinel, but these could not be isolated for analys Analyses of the rock show TiO_2 3·6 % which is returned in the norm rutile. L. J. S.

Butler (John W. *Jr.*). *Origin of the emery deposits near Peeksk New York.* Amer. Min., 1936, vol. 21, pp. 537–574, 18 figs.

e emery forms lenses near the contact of norite and pyroxenite quartz-mica-schist, for the most part in the exomorphosed schist, gh some is found in xenoliths of schist in the endomorphosed igneous The 'ore' consists of spinel (sometimes predominating) with ble amounts of corundum, magnetite, haematite, and ilmenite, occasional högbomite; intermixed are fibrolite, kyanite, staurolite, erite, garnet, biotite, &c. The rocks are described and the various ies of the origin of the deposits are discussed. In their contact-morphic (pyrometasomatic) origin, it is believed that emanations the fluid magma passed into the schist a short distance in advance e magma. L. J. S.

HROMEEV (S. A.), ZIMIN (I. A.), KOZHEVNIKOV (K. E.), LASKOV (A. N.), & MAZAEV (G. M.)] Вахромеев (С. А.), Зимин (И. А.), Кожевников (К. Е.), Ласьков (А. Н.) и Мазаев (Г. М.).—Уральские месторождения хромита.—*Chromite deposits in the Urals.* Труд. Всесоюзн. Научно-Иссл. Инст. Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 1936, no. 85, 240 pp., 70 figs. (Russian with English summary.)

romite deposits of the Urals are confined to the ultrabasic plutonic s and especially to dunite and peridotite serpentines. Chromite rs in the form of nests, schlieren, and veins usually at the peripheral of an intrusive mass. Numerous analyses of ores given in this work recalculated and plotted according to the scheme of E. S. Simpson . Mag. **19**–99], whose nomenclature is amplified. The majority of ses fall into the field of alumo-chrompicotite but they also occupy ields of chrompicotite, berezovite, alumo-berezovite, and magno-nite. Three genetic types of chromite deposits are distinguished: ccumulative, products of crystallization-differentiation, (2) fusive, ucts of residual magmatic liquor, and (3) intermediate between the two types. S. I. T.

IOVA (Z. N.)] Немова (З. Н.) Микроскопическое исследование бокситов северного Урала.—NEMOVA (Z. N.). *Microscopical investigation of bauxites of northern Ural.* Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétrogr. Acad. Sci. URSS), 1934, no. 6, pp. 485–489, 1 fig. (Russian with English summary.)

chemical, microscopical, and X-ray study of bauxites from Bogo-ky region, northern Urals, shows the existence of two types, mitic and diasporic. The presence of colloidal titanium oxide in auxites was proved by a micro-chemical reaction. S. I. T.

[Moldavantzev (E. P.)] Молдаванцев (Е. П.). Бокситы северн Урала и проблема их изучения.—Moldavantsev (E.). *Baux of the northern Urals and the problems of their investigation.* Тр Центр. Научно-Иссл. Геол.-Разв. Инст. (Trans. Central G Prosp. Inst. USSR), 1934, no. 24, pp. 56, 1 map, 6 text-f (Russian with English summary.)

Recently discovered bauxite deposits of the northern Urals are fou interbedded with the lower and middle Devonian limestones. Grey a red varieties are distinguished. They are characterized by the p dominance of alumina monohydrate. Several analyses are given.

S. I. T

[Velikovskaya (E. M.)] Великовская (Е. М.). Бокситы северо-вост ного Казахстана. *The bauxites of the north-eastern part of Kasa stan.* Бокситы. Труд. Всесоюзн. Научно-Иссл. Инст. Мин. Сы (Bauxites. Trans. All-Union Sci. Research Inst. Econ. Min.), 111, 1936, vol. 1, part 2, pp. 3–62, 12 figs. (Russian), pp. 223– (English summary).

[Shchukina (E. N.)] Щукина (Е. Н.). Бокситы Енисейского кряжа Tschukina (E. N.). *The bauxites of the Eniseisky range.* Ib pp. 63–124. (Russian), pp. 225–227 (English summary).

[Rozhkova (E. V.) & Soboleva (M. V.)] Рожкова (Е. В.) и Собол (М. В.). Минералогия и условия образования бобовых желе алюминиевых руд. —*The mineralogy and condition of formation pisolitic iron-aluminium ores.* Ibid., pp. 145–204, 2 pls., 5 text-f (Russian), pp. 228–230 (English summary).

[Rozhkova (E. V.) & Soloviev (N. V.)] Рожкова (Е. В.) и Солов (Н. В.). Экспериментальное изучение условий образования бо вых железо-алюминиевых руд.—*An experimental study of conditions of formation of pisolitic iron-aluminium ores.* Ib pp. 205–216, 1 pl., 1 text-fig. (Russian), pp. 230–231 (Eng summary).

Ferruginous bauxite deposits are found among the Jurassic sedime (variegated clay, sand, and coal) of the southern Urals and Kazakst They occur either as continuous layers or as pockets in clay, and often associated with gypsum. A great number of analyses of ore well of the pisolites and the groundmass is given. The pisolites on whole are richer in iron than the groundmass. The only crystal minerals observed are gibbsite, and more rarely kaolinite and diasp

ene, and rutile. A yellowish-white, brittle, scaly mineral from the olovsky deposit on analysis gave: SiO_2 2·27, TiO_2 6·14, Al_2O_3 41·37, O_3 22·33, H_2O- 3·19, ign. loss 20·67 = 95·97. The regolith mantle erlying the Jurassic sediments and overlying the Palaeozoic strata haracterized by the kaolinitic type of weathering and does not cate the presence of free alumina hydroxides. The bauxite deposits e been formed probably by precipitation from solution near the re of land-locked basins.

he experiments of precipitation of colloidal iron and aluminium roxides from solutions of neutral salts show that only a small ition of ammonia or alkali results in the formation of gelatinous litic concretions. Pisolites are formed at *p*H 2·5–3, become stable at 4–7, and above *p*H 7 are converted into a structureless gel. Magnetic perties possessed by certain bauxites are reproduced *in vitro* by cipitation from a mixture of ferric and ferrous salts. S. I. T.

ÉNYI (Tibor). *Bauxitok berylliumtartalmának szinképanalytikai meghatározása.—Spektralanalytische Bestimmung des Berylliumgehaltes der Bauxite.* Mat. Term.-tud. Értesítő, Budapest, 1937, vol. 56, pp. 231–246, 4 figs. (Hung.), pp. 247–248 (Germ. summary).

auxites from Bosnia, Dalmatia, and Hungary contain on the average 5–0·01 % BeO. There is no essential difference in the amount ent in bauxites and Hungarian clays, but some kaolins are very r in BeO. V. Z.

ov (Alexandr). *První výskyt bauxitu v Československu.* [The first occurrence of bauxite in Czechoslovakia.] Rozpravy České Akad., Cl. II, 1937, vol. 47, no. 13, 22 pp., 1 pl.

t Mojtín near Žilina in NW. Slovakia, irregular bodies of bauxite situated on Triassic limestones and dolomites under a cover of ene conglomerates. They vary in colour from white to brown, ow, and red, those of a brown colour being more compact and homoeous. Microscopically the predominant component appears to be orphous aluminium hydroxide, whilst the pisolites consist of haema- and vermiculitic kaolinite. Some pisolites (0·2–7 mm. diam.) consist adiating authigenic tourmaline. The white and yellow varieties are uently banded, due to rhythmic precipitation of iron hydroxide. hnical analyses show that the composition is very variable. Complete lyses: I, chocolate-brown pisolitic variety, suggesting the presence oehmite, gibbsite (?), kaolinite, allophane, and goethite; II, white,

and III, pale yellow, suggesting aluminium monohydrate, halloysi and goethite. Titanium is present as hydroxide or as some undetermin colloidal complex. Detailed dehydration data are given. The gene of the bauxites cannot yet be interpreted definitely, but the evidenc are against the terra rossa theory and the chemical alteration of denud clays or marls.

	SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	MnO.	MgO.	CaO.	Na_2O.	K_2O.	H_2O
I.	15·76	3·80	42·95	18·97	0·43	0·13	0·28	0·05	0·23	16·7
II.	6·83	2·00	73·48	0·97	0·10	0·07	0·09	—	—	15·0
III.	5·88	2·40	69·22	6·08	0·14	0·05	0·18	—	—	14·9

			Soluble in HCl					Soluble
	H_2O—.	Total.	Total.	SiO_2	TiO_2.	Al_2O_3.	Fe_2O_3.	H_2SO_4
I.	1·12	100·42	58·70	3·56	1·60	23·24	18·76	67·16
II.	1·29	99·90	23·50	2·80	—	14·07	0·93	87·60
III.	1·26	100·17	30·60	4·20	—	10·51	5·89	89·30

F. S.

Howling (G. E.). *Asbestos.* Reports on the mineral industry of t British Empire and foreign countries. Mineral Resources Dep Imperial Institute, London, 1937, 2nd edition, 88 pp. Price 2*s*.

The first edition appeared in 1921, and this second edition has be entirely rewritten and much enlarged. It gives a useful summary of t characters, working, and uses of the different kinds of asbestos, wi full details of occurrences and statistics of production in the seve countries. A detailed bibliography is appended. [M.A. **6**-485.]

L. J. S.

[Tatarinov (P. M.), Kuznetzov (V. A.), & Filatov (K. S.)] Татарин (П. М.), Кузнецов (В. А.) и Филатов (К. С.). Геологическ исследования в районе Актовракского месторождения асбеста верховьях р. Енисея (1932 г.).—Tatarinov (P. M.), Kusnets (V. A.), and Filatov (K. S.). *Geological researches in the district the Aktovrak deposit of chrysotile-asbestos in the upper course of t Ienisey river in 1932.* Труд. Центр. Научно-Иссл. Геол.-Раз Инст. (Trans. Central Geol. Prosp. Inst. USSR), 1934, no. 1 pp. 56, 2 maps, 13 text-figs. (Russian with English summary.)

Good quality chrysotile-asbestos is found in veins cutting throu serpentinized harzburgite—a member of the basic complex intrud into lower Palaeozoic rocks of the upper course of Yenisei in Out Mongolia. S. I. T.

ILSON (Joseph L.). *Talc, soapstone, and pyrophyllite.* Industrial Minerals and Rocks (Amer. Inst. Mining Metall.), 1937, pp. 873–892.
compilation of the properties, occurrence, origin, deposits, mining, ing, and uses of talc (and of less importance pyrophyllite), with a iled bibliography. L. J. S.

RTRAND (Gabriel). *Présence et répartition du bore dans les sels potassiques d'Alsace.* Compt. Rend. Acad. Sci. Paris, 1937, vol. 205, pp. 473–476.
he potash deposits of Alsace consist of layers of sylvine from a few ver 100 cm. thick, of colours varying from colourless to grey or red, separated by thin layers of clay. The colourless and reddish layers tain 1–2 mg./kg. of boron, the more intensely red layers up to 6 mg., grey (which are the lowest) 10–20 mg., while the clay in immediate tact with the sylvine may contain as much as 50–100 mg./kg. of on. C. A. S.

ATZKY (Jean) & GOLOUBINOW (Rostislav). *Sur l'origine de l'or dans les confins guinéo-soudanais et dans l'ancienne Haute-Volta.* Compt. Rend. Acad. Sci. Paris, 1937, vol. 205, pp. 925–927.
n contrast to the views expressed by some authors that the gold of nch West Africa is mainly derived from granitic rocks, it is now wn that such derivation is exceptional and that the gold is chiefly nected in almost every case with basic rocks such as, in particular, gabbros and dolerites of the Upper Volta. C. A. S.

SHKO (S. A.)] Юшко (С. А.). О минералогической форме золота и его ассоциациях в колчеданистых рудах Урала.—Juško (S. A.). *Über die mineralogische Form des Goldes und seine Assoziationen in den Kieserzen des Urals.* Изв. Акад. Наук СССР, Отд. Мат.-Ест., Сер. Геол. (Bull. Acad. Sci. URSS, Cl. Sci. Math.-Nat. Sér., Géol.), 1936, pp. 435–440. (Russian with German summary.)
Native gold is associated with galena, fahlerz, chalcopyrite, blende, , in the sulphide ores of the Baimak region, Urals. The paragenetic tions indicate a low temperature hydrothermal stage of formation old. S. I. T.

NDALE-BISCOE (R.). *Preliminary report on the geology and mines of the Gwanda gold belt.* Short Rep. Geol. Surv. Southern Rhodesia, 1937, no. 30, 33 pp., 11 pls.
he Gwanda gold belt lies on the southern flank of the high plateau

of Southern Rhodesia. It has the usual character of a belt of ancie schists, quartzites, and ironstones completely enveloped by grani Gold occurs in any of the old rocks except serpentine, but with a decid preference for the greenstones, and also in the granite near its contac with schist. The reefs include lenses of quartz in fractures, impregn tions in banded ironstone, and impregnations in shear zones. Br accounts are given of about 70 mines and claims. S. J. S.

Macgregor (A. M.). *The geology of the Makaha gold belt, Mtoko distri* Bull. Geol. Surv. Southern Rhodesia, 1935, no. 28, 47 pp., 1 ma Price 1*s.* 9*d.*

Describing a little-known goldfield in the extreme NE. quarter Southern Rhodesia. As usual, the area is honeycombed with ancie workings, and the gold belt consists of a body of ancient schists, son 33 miles long and 10 miles wide, entirely surrounded by granite-gneis The ore-bodies are quartz reefs in schist, impregnations in banded iro stone, and in one case an impregnation of weathered granite.

S. J. S.

[Ozerov (I. M.)] Озеров (И. М.). Мышьяковые месторожден Восточно-Сибирского края.—Ozerow (I. M.). *The arsenic depos of East Siberia.* Труд. Центр. Научно-Иссл. Геол.-Разв. Ин (Trans. Central Geol. Prosp. Inst. USSR), 1934, no. 14, 40 pp 1 map, 10 text-figs. (Russian with English summary.)

The estimated resources of arsenic deposits in the east Transbaikali region are over 50% of the total for USSR. Three metallogenic provinc are distinguished: (1) eastern—polymetallic (Pb,Zn,Ag); (2) central arsenopyrite, Sn,W; and (3) western—arsenopyrite, Au. The individu occurrences are described and their genetic correlations with igneo rocks are indicated. S. I. T.

Kato (Takeo). *Two types of nickeliferous pyrrhotite deposits found Korea.* Japanese Journ. Geol. Geogr., 1936, vol. 13, pp. 269–27 1 pl., 3 text-figs.

In the Kinjo mine, Kogen-do, an ore pipe occurs in the centre of dike of biotite-diorite, and belongs to the latest orthomagmatic stag The pyrrhotine is present as small patches and grains replacing silicat and it contains bravoite and exsolution pentlandite. In the Unsy mine, Kankyo-nando, a lenticle of ore occurs in crystalline dolomit rock and in a small dike of biotite-diorite, and here belongs to t hydrothermal stage. L. J. S.

MURA (Takeshi). *Geological investigations on some characteristic haematite and limonite deposits in s[outh] Heian-dô and Kôdai-dô, Chôsen (Korea).* Mem. Fac. Sci. Taihoku Univ., 1936, vol. 13, no. 6, pp. 75–206, 6 pls., 26 text-figs.

portant deposits of iron ore occur in folded sediments (pre-brian to Cretaceous) associated with a variety of igneous rocks. primary minerals appear to have been chalybite and pyrite, and were probably deposited by magmatic waters. L. J. S.

SAU (Gabor). *I minerali dei filoni a nichelio e cobalto dell'Arburese (Sardegna).* Periodico Min. Roma, 1936, vol. 7, pp. 21–39, 3 pls.

croscopical examination of polished sections of the ore shows the nce of niccolite, breithauptite, smaltite-chloanthite, safflorite-rammelsbergite, bismuthinite, native bismuth, millerite, löllingite, &c.

L. J. S.

N (J. A.). *A study of some microscopical aspects of Indian manganese-ores.* Trans. Nat. Inst. Sci. India, 1936, vol. 1, no. 7, pp. 103–124, 3 pls., 1 text-fig.

e following minerals (in the order of increasing reflecting power) identified under the ore-microscope: manganite, braunite, jacobsite, mannite, sitaparite, psilomelane, hollandite, and pyrolusite and rite. They are frequently much intermixed in the ores. Pyrolusite psilomelane are weathering products; the others are of metamorphic tasomatic origin. Vredenburgite (of L. L. Fermor, 1908) is found e a mixture, usually of jacobsite and hausmannite. Analyses of two mens with predominating jacobsite gave SiO_2 0·10 (0·27), TiO_2 nil), Al_2O_3 0·35 (1·03), Fe_2O_3 calc. 59·31 (53·03), MnO_2 4·82 (11·35), calc. 34·61 (33·31), MgO 0·12 (0·59), CaO 0·17 (0·30), ZnO trace e), P_2O_5 nil (trace), H_2O 0·082 (0·47), total 99·562 (100·50), sp. gr. 7 (4·823), from which the formula is deduced as $3Mn_3O_4.4Fe_3O_4$ or $(Fe,Mn)_2O_3$. L. J. S.

G (H. M.) & CHANG (K.). *Geology of the Hsianghualing tin deposits, Lingwu, Hunan.* Mem. National Research Inst. Geol. Acad. Sinica, Nanking, 1935, no. 15, pp. 15–72, 27+5 pls., 2 text-figs.

ranite intrusive into limestone has produced intense contact-metaphic and pneumatolytic effects. Cassiterite occurs as small crystals grains in greisen and marble and in protolithionite-fluorite- and ndum-cancrinite-rocks. Fifty species of minerals are described.

Chemical analyses of the micas (lepidolite, zinnwaldite, and pr lithionite) are unusual in showing the presence of B_2O_3 (0·68–2·48 L. J.

Piepoli (P.) & Collari (N.). *Sul giacimento stannifero di Canali S (Villacidro: Iglesias).* Periodico Min. Roma, 1937, vol. 7, pp. 169, 3 pls., 3 text-figs.

Collari (N.). *Sulla analisi del minerale misto di Canali Serci.* Il pp. 179–185.

Veins of cassiterite with blende, galena, pyrite, &c., occur in Silu slates intruded by granite, in Sardinia. L. J.

Legraye (M.). *L'association galène-chalcopyrite-blende dans le cry du Groenland.* Ann. (Bull.) Soc. Géol. Belgique, 1938, vol. pp. B 109–B 113, 1 fig.

The cryolite deposit in granite at Ivigtut is of pegmatitic-pneum lytic origin and contains sulphides with chalybite and cassiterite. blende contains inclusions of chalcopyrite which separated by exsolu on slow cooling. L. J.

Raguin (Eugène) & Vincienne (Henri). *Sur un type exceptio (hypothermal) de gisement plombeux dans la Montagne-Noire.* Co Rend. Acad. Sci. Paris, 1937, vol. 204, pp. 1953–1954.

A deposit of galena occurs on the south slope of the Black Mt., Lacombe, Aude. It is a stratified impregnation in a bed of Camb dolomitic limestone, which forms a massive stratum some tens of me thick intercalated in mineralized schists. The galena, which is associa with a little pyrite and less blende, follows the lines of bedding, w are intersected by more recent veins of quartzite carrying someti tetrahedrite and baryte. Microscopic examination shows chlorite, tite, and pyrrhotine in the neighbouring dolomite. The deposit app to have been formed under hypothermal conditions. C. A.

Holmes (Arthur). *The origin of primary lead ores.* Econ. Geol., 1 vol. 32, pp. 763–782, 2 figs.

From a consideration of the atomic weights of common lead (ore-l and radiogenic lead and the amounts of rock-lead present in igneous sedimentary rocks, it is concluded that lead ores (and perhaps also s other sulphide ores) have been derived from some greater depth in earth's crust than the zone of ordinary igneous rocks. This supports view of J. W. Gregory [M.A. **2**–271]. L. J.

ER (W. A.). *Origin of the southeastern Missouri lead deposits.* Econ. Geol., 1936, vol. 31, pp. 712–754, 832–866, 18 figs.

alena, with marcasite and some siegenite, occurs as bedded deposits disseminated in Cambrian dolomite. The different views of the n are reviewed; and it is considered that the ore was deposited by matic waters, rather than by surface waters. L. J. S.

ER (W. A.). *Origin of the marcasite sink-hole deposits of central Missouri.* Amer. Min., 1937, vol. 22, pp. 830–841, 8 figs.

brous concretionary, plumose, or massive granular marcasite with tle pyrite occurs in the lower part of sink-holes in Ordovician dolo-. The bodies are usually 10–30 feet thick, and the overlying haema-ore, usually less than 100 feet thick, has in many cases now been ed out. The marcasite was probably deposited from magmatic tions ($FeCl_3$ and H_2S) in pre-existing cavities in Cretaceous time. n the upper part of the deposits came into the ground-water region ineral was oxidized with the development of heat. L. J. S.

Miscellaneous.

YE (F. T.). *A manganiferous zeolite from the Waihi mine.* New Zealand Journ. Sci. Techn., 1937, vol. 19, pp. 198–199.

pink radiating fibrous mineral, from a gold-quartz vein in andesite, entified with inesite. It is decomposed by HCl with separation of idal silica; sp. gr. 2·87–2·96. Analysis (after deducting 14·4 % tz and 2·85 % $MgCO_3$) gave SiO_2 45·30, Al_2O_3 0·56, FeO 0·82, MnO), MgO 0·52, CaO 8·04, Na_2O 0·13, K_2O 0·06, H_2O+ 6·05, H_2O- = 100·00. L. J. S.

ZCZYNSKI (S. von) & STOICOVICI (E.). *Über einen Pseudobrookit-zwilling.* Zentr. Min., Abt. A, 1937, pp. 343–349, 3 figs.

knee-shaped twin on (230) of pseudobrookite from Uroi (= Aranyer), Transylvania, is described and explained in connexion with the tal-structure [M.A. **4**–274]. L. J. S.

RO (Carlo). *Anglesite di Cuccuru Pau (Arburese—Sardegna).* Perio-dico Min. Roma, 1937, vol. 8, pp. 303–310, 6 figs.

nall, brilliant and transparent crystals of anglesite in cavities in ive galena show the forms *a c m n o d z s* [Dana's letters]. L. J. S.

Cavinato (A.). *La morenosite di val Malenco.* Atti (Rend.) R. Acc
Lincei, Cl. Sci. fis. mat. nat., Roma, 1937, ser. 6, vol. 25,
399–401.

A green-blue, finely fibrous encrustation on serpentine from
Malenco, Lombardy, gave SO_4 31·87, Ni 11·97, Mg 3·11, H_2O 41·
insol. 11·32 = '100·22'. L. J. S

Cavinato (Antonio). *Morenosite di Valtournanche.* Periodico M
Roma, 1938, vol. 9, pp. 141–142.

A thin crust on serpentine from Busserailles, Piedmont, gave S
29·58, NiO 27·16, MgO 0·25, Al_2O_3 0·10, Fe_2O_3 0·21, Cu trace, H
42·49 = 99·79. The formula is given as $NiSO_4.6\frac{1}{2}H_2O$ [but 5·35
insoluble in water was deducted]. L. J. S

Cavinato (A.). *Valentinite della miniera di Ballao.* Atti (Ren
R. Accad. Lincei, Cl. Sci. fis. mat. nat., Roma, 1937, ser. 6, vol.
pp. 140–144, 4 figs.

Grey to yellow crystals of valentinite in cavities in the antimony
(stibnite) of the Ballao mine [Sardinia] have the form of acute
pyramids *v* (5.10.8); other forms are *m μ b r* [Dana's letters] and (05
Optic axial plane (001) for all colours, Bx_a negative ⊥ (010). Refract
indices [cf. M.A. **7**–119] determined through a prism (110) ($\bar{1}10$):

	Red.	Yellow.	Green.	Violet.
α	2·330	2·352	2·360	2·430
β	2·334	2·358	2·372	2·445
2E.	16–17°	14–15°	—	10–11°

L. J. S

Tokody (László). *Kristálytani vizsgálatok magyarországi kvarcok*
—Tokody (L.). *Kristallographische Untersuchungen einiger*
garischen Quarzkristalle. Mat. Term.-tud. Értesítő, Budapest, 19
vol. 55, pp. 985–1000 (Hungarian), pp. 1001–1004 (German), 1

Study of quartz crystals from Felsőbánya (com. Szatmár), Kisbá
(com. Szatmár), Toplica (com. Hunyad), Velence Mts. (com. Fejér),
Luciabánya (com. Abauj-Torna), chiefly in respect to vicinal pyram
on the faces *m*, *r*, *z*, and their right- or left-handed character. Sm
(1–1·5 mm.) crystals with plumosite from Felsőbánya are simple
twinned on ξ (11$\bar{2}$2); these interpenetrating Japanese twins formin
cross and without flattening on the prism planes perpendicular to
twin-plane. Crystals from Felsőbánya, Kisbánya, and Luciabánya sh

vicinal type II of G. Kalb [M.A. **3**–484], and are of hydrothermal
in at a temperature below 575° C. V. Z.

ODY (László). *Nagyági antimonit.*—TOKODY (L.). *Antimonit von Nagyág.* Ann. Mus. Nat. Hungarici, Min. Geol. Pal., 1938, vol. 31 (for 1937–38), pp. 165–170, 1 fig. (Hungarian with German summary.)

ystals of stibnite, 2–3·5 mm. long and 0·5–1 mm. thick, on quartz the forms *b θ d r m ι s β* [Dana's letters], (1.12.0), (180), (560), (12.1.0), and new (790), (9.11.0), (780), (9.10.0), (980), (740).
V. Z.

ODY (László). *Füleki aragonit.*—TOKODY (L.). *Aragonit von Fülek.* Ann. Mus. Nat. Hungarici, Min. Geol. Pal., 1938, vol. 31 (for 1937–38), pp. 171–178, 2 figs. (Hungarian with German summary.)

iourless prismatic crystals up to 8 mm. long from basalt at Fülek, Nógrád, show the forms *b k e ν j ϵ θ ρ η m p*? Ψ [Dana's letters], .2), (0.11.1), (0.17.1), (0.18.1), (0.19.1), (0.45.2), (0.26.1), (0.27.1), .1), (0.32.1), (0.35.1), (0.40.1), (0.48.1), (13.13.1), and new (0.19.2), .2). V. Z.

GYEL (Endre). *Krisztobalit Sárospatak környékéről.*—LENGYEL (E. v.). *Cristobalit von der Umgebung von Sárospatak.* Földtani Közlöny, Budapest, 1937, vol. 67, pp. 309–314 (Hung.), 330–331 (Germ.), 1 pl., 1 text-fig.

ibular grains (30–60 μ) of cubic cristobalite fill the interspaces een spherulites in rhyolite from Makkoshotyka near Sárospatak, Zemplén. Parallel growths, twins on (111), and rosette-shaped ps are common, and they are associated with lamellae of tridymite. the spherulites pass on their exterior into cristobalite, it is sup- d that the silica fibres of their interior consist of α-cristobalite. It ggested that cristobalite and tridymite originated from the glassy ix of the rock by post-volcanic, particularly thermal, action.
V. Z.

TON (Carl E.). *Cristobalite at Crater Lake, Oregon.* Amer. Min., 1937, vol. 22, pp. 804–806.

tahedral and skeletal crystals, up to 1 mm. across, of cristobalite r with sanidine and augite in small cavities in andesite. L. J. S.

SHKAY (Mir-Ali)] Кашкай (Мир-Али). Об осмистом иридии и золотоносных шлихах Кузнецкого Алатау.—KASCHKAY (Mir-Ali).

On the osmium-irridium and goldbearing schlichs of the Kuznetsk A tau. Труд. Петр. Инст. Акад. Наук СССР (Trav. Inst. Pétro Acad. Sci. URSS), 1934, no. 6, pp. 239–250, 2 figs. (Russian w English summary.)

Osmiridium (nevyanskite) from Bolshaya Victorievka mine, Kusnets Alatau, West Siberia, analysed by O. E. Zvyagintzev, gave Os 40·3, 41·6, Ru 4·2, Pt 1·1, Au 1·8, Fe 8·5. X-ray measurements gave *a* 2·7 *c* 4·267 Å., *c*/*a* 1·573 (hexagonal close packing). Sixteen samples gold-washings are also described and a number of minerals recorded S. I. T.

[Zvyagintzev (O. E.)] Звягинцев (О. Е.). Осмистый иридий с ре Б. Лабы.—Zvyagintsew (O. E.). *Osmiridium of the northe Caucasus.* Академику В. И. Вернадскому к пятидесятилет научной и педагогической деятельности, Акад. Наук СССР [V nadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 80 811. (Russian with English summary.)

Ruthenium-bearing nevyanskite was found in alluvial deposits ass ciated with serpentine of the Great Laba river, northern Caucasus. T analysis gave Os 43, Pt 7, Ir+Rh 33, Ru 13, Fe 4·6; and the X-r analysis gave *a* 2·67, *c* 4·41 Å. S. I. T.

[Zvyagintzev (O. E.) Звягинцев (О. Е.).].—Zviagincev (O. E.). *osmiridium. Osmiridium with a cubic crystalline lattice.* Com Rend. (Doklady) Acad. Sci. URSS, 1938, vol. 18, pp. 295–297.

Amongst the insoluble residues of Uralian crude platinum are so silver-white grains that have no cleavage and are only slightly malleab breaking with a conchoidal fracture. They are very hard (scratchi agate) and insoluble in aqua regia. Analysis gave Ir 65·4, Os 31 Rh 1·8 %. X-ray photographs show a cubic face-centred structure wi *a* 3·8415, near to that of iridium [M.A. **5**–308]. In the system Os-Ir, allo with less than 31–35 % Os are cubic, and those with more are hexago [M.A. **6**–51]. The natural alloys are divided into three groups: iridium group with 0–35 % Os, cubic; (2) nevyanskite with 35–50 % O (3) sysertskite with 50–70 % Os. L. J. S.

[Mikei (I. Y.)] Микей (И. Я. (А. Я.)). К вопросу о химическ природе и строении глауконита.—Mickey (I.). *Zur Frage ueber chemische Natur und den Bau des Glaukonits.* Академику В. Вернадскому к пятидесятилетию научной и педагогическ

деятельности, Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR], 1936, vol. 2, pp. 813–826. (Russian with German summary.)

auconite is a definite mineral with a type of lattice which is related nicoids'. Alumoferri silicate (proglauconite) of the type $4SiO_2.R_2O_3$ t the base of glauconite structure. This with water forms an acid e type $R''_2'''Si_4O_7(OH)$. During the processes of halmyrolysis and rgenesis proglauconite hydrogel absorbs K, Mg, and to a lesser e Na, Ca, and Li ions. The final formula is $R''_2'''Si_4O_{11}.qH_2O+$ O+RO). On ageing, glauconite shows a tendency to transforma- into a crystalloid. S. I. T.

PIONI-ZAKRZEWSKA (Maria). *O glaukonicie z margli kredowych okolicy Żurawna.—Sur la glauconie des marnes crétacées des environs de Żurawno.* Arch. Min. Tow. Nauk. Warszaw. (Arch. Min. Soc. Sci. Varsovie), 1937, vol. 13, pp. 9–17 (Polish), pp. 18–19 (French), 1 fig.

ains of glauconite 0·1–0·6 mm. diameter, with sp. gr. 2·77, *n* 1·593, SiO_2 49·81, TiO_2 trace, Al_2O_3 6·33, Fe_2O_3 13·24, FeO 5·81, MgO , CaO 1·58, Na_2O 0·16, K_2O 7·45, P_2O_5 0·33, CO_2 0·98, H_2O 9·70 = , agreeing with the formula $R'_2O.4(R''O,R''_2'''O_3).10SiO_2.nH_2O$ of . Hallimond [M.A. **4**–206], but not with that of K. Smulikowski . **6**–345]. There is an abrupt break in the dehydration curve at C., above which 3·58 % H_2O is lost. L. J. S.

EUX (Lucien). *Rôle des foraminifères et du carbonate de chaux dans la fixation de certaines substances minérales.* Compt. Rend. Acad. Sci. Paris, 1938, vol. 206, pp. 81–85.

ie formation of glauconite, phosphate of lime, or pyrite is in no due to foraminifera, but to epigenetic substitution of the calcite ting from the chalky mud that fills the shells when they fall to the om of the ocean. Similar arguments apply to the formation of ndary quartz. Accordingly all attempts at artificial formation of minerals require the presence of $CaCO_3$. C. A. S.

OCK (M. A.). *On the crystallography of axinite and the normal setting of triclinic crystals.* Amer. Min., 1937, vol. 22, pp. 588–620, 5 figs. Appendix: DONNAY (J. D. H.). *Transformation of co-ordinates.* pp. 621–624.

The normal triclinic setting: correction. Ibid., pp. 987–989, 2 figs.

A review is given of the various attempts that have been made arrive at a systematic setting for triclinic crystals. The 'normal setti agrees with the structural lattice (except in plagioclase). This can judged from an inspection of the gnomonic projection. The crystal graphic axes and unit cell are oriented so that a prominent prism-z is vertical, (001) is the first octant, and b longer than a. Several differ sets of axes and orientations have in the past been adopted for axin The data are now presented in the form $a:b:c = 0{\cdot}7789:1:0{\cdot}97$ α 91° 51½′, β 98° 4′, γ 77° 14′. X-ray measurements of a crystal fr Easton, Pennsylvania, gave results in agreement with this, viz. a 7·1 b 9·184, c 8·935 Å., α 91° 52′, β 98° 9′, γ 77° 19′, the unit cell contain $H_2B_2Al_4Ca_4(Mn,Fe)_2Si_8O_{32}$. The optical orientation is given for t crystal; α 1·683, β 1·688, γ 1·692, 2V 81°. The unit cell of Gossner Reichel [M.A. **5**–324] does not give the shortest identity periods.

L. J. S

Peacock (M. A.). *On rosenbuschite.* Norsk Geol. Tidsskrift, 19 vol. 17, pp. 17–30, 3 figs.

X-ray examination of rosenbuschite from Langesundsfjord, Norw shows it to be triclinic with a unit cell a 10·12, b 11·39, c 7·27 ($a:b:c = 0{\cdot}8887:1:0{\cdot}6383$), α 91° 21′, β 99° 38½′, γ 111° 54½′. Refract indices α 1·678, β 1·687, γ 1·705, $\alpha = c$ (parallel to length of needl γ at 28½° to normal to the cleavage (100). The unit cell conta $4[(Na,Ca,Mn)_3(Fe''',Ti,Zr)(SiO_4)_2F]$. The mineral is related to wöhlerite group rather than to wollastonite and pectolite. L. J. S

Richmond (Wallace E., *Jr.*) *On babingtonite.* Amer. Min., 1937, vol. pp. 630–642, 7 figs.

Small crystals of babingtonite in calcite veins in granite-pegma at Blueberry Mtn., Woburn, Massachusetts [M.A. **5**–233], gave goi metric measurements close to those of A. Dauber (1855). In the nor triclinic setting of M. A. Peacock (preceding abstracts) Dauber's a become $a:b:c = 0{\cdot}6417:1:0{\cdot}5746$, α 91° 31′, β 93° 51′, γ 104° 4′. N forms are j (310), e ($\bar{1}\bar{1}1$), k ($\bar{1}\bar{2}1$). This agrees with the unit cell gi by X-rays, a 6·61, b 11·52, c 6·61 Å., α 91° 48′, β 93° 48′, γ 103° containing $Fe''_2Fe''_2Ca_4Si_{10}O_{28}(OH)_2$. The optical orientation is fix α 1·720, β 1·731, γ 1·753, 2V 76°±2°, positive. A crystallographic r tion with rhodonite is suggested. The unit cell of Gossner and Mussg [M.A. **4**–109] does not correspond with the three shortest iden periods. L. J. S

FFE (C. W.). *Re-orientation of römerite.* Amer. Min., 1937, vol. 22, pp. 736–741, 2 figs.; 1938, vol. 23, p. 468.

merite in the normal triclinic setting of M. A. Peacock (1937), the measurements of H. Ungemach [M.A. **6**–149], has $a:b:c =$ 4:1:0·4174, α 91° 17′, β 100° 30′, γ 85° 31′. L. J. S.

GH (F. H.). *The morphology of gordonite.* Amer. Min., 1937, vol. 22, pp. 625–629, 3 figs.

ystals of gordonite from Fairfield, Utah [M.A. **4**–343], in the normal nic setting of M. A. Peacock (1937) have $a:b:c = 0{\cdot}5192:1:0{\cdot}6942$, 9° 27′, β 110° 57½′, γ 71° 40½′. The prominent face (010) is parallel ie best cleavage. L. J. S.

GH (Frederick H.). *The morphology of wardite.* Amer. Mus. Novitates, 1937, no. 932, 5 pp., 3 figs.

nall bipyramidal-ditetragonal crystals of wardite from Fairfield, h [M.A. **4**–343], gave from poor measurements $a:c = 1:1{\cdot}3117$. The ominating bipyramid is *t* (13.0.12); other forms are *c* (001), *a* (100), 01), and others with high indices doubtful. The form (111) of ansite becomes (112). The crystals are often deeply corroded, but basal plane remains smooth. The basal plane and the pyramid s are sometimes encrusted with millisite. L. J. S.

ER (James M.). *Sericite from the Taylor-Windfall mine, British Columbia.* Univ. Toronto Studies, Geol. Ser., 1937, no. 40, pp. 103–113.

hite, soft, and scaly sericite from an ore vein in silicified tuff has gr. 2·803, α 1·552, β 1·587, γ 1·589, 2V 22°, and gave SiO_2 47·80, (as rutile) 0·65, Al_2O_3 37·70, MgO 0·17, Na_2O 0·34, K_2O 8·65, 4·97, Fe,Mn,Ca traces, total 100·28, agreeing with the muscovite ula $(H,K)_2O.Al_2O_3.2SiO_2$. Most of the water is lost between 450° 650° C., i.e. lower than with muscovite, and the optical data also lower values. L. J. S.

DSCHMIDT (V. M.). *The principles of distribution of chemical elements in minerals and rocks.* Journ. Chem. Soc. London, 1937, pp. 655–673, 3 figs.

lecture giving a general review of the results obtained by the author his co-workers at Göttingen during 1930–36 (with list of papers ished). A table shows the relative abundance of the chemical ents in the earth's crust. [M.A. **6**–205.] L. J. S.

Goldschmidt (V. M.). *Geochemische Verteilungsgesetze der Eleme IX. Die Mengenverhältnisse der Elemente und der Atom-Ar* Skrifter Norske Vidensk.-Akad., I. Mat.-Nat. Kl., Oslo, 1938, 1937, no. 4, 148 pp., 6 figs.

Parts I–VIII of this series appeared in 1923–27 [M.A. **2**–159; **3**–1 261, 326]. The present part collects and reviews data on the relat abundance of the chemical elements in the earth's crust, in meteori and in the universe [M.A. **5**–7]. A summary table (pp. 99–101) gives amounts in grams per metric ton, and as the number of atoms per atoms of silicon, present in igneous rocks, meteorites, and the su atmosphere. This brings up to date the tables of Clarke and Washing [M.A. **2**–389, 558] and of I. and W. Noddack [M.A. **5**–6, **6**–205]. distribution of elements in the metallic, sulphide, and silicate porti of meteorites is discussed. Isotopes are also considered and their relat frequencies tabulated (pp. 120–121). L. J. S

Pough (Frederick H.). *Crystallized powellite from Tonopah, Neva* Amer. Min., 1937, vol. 22, pp. 57–63, 6 figs.

Palache (C.). *Note on powellite from Isle Royale mine, Hought Michigan.* Ibid., pp. 63–64, 1 fig.

Crusts of small, pale to dark brown crystals of powellite occur cavities in altered rhyolite at Tonopah. They are pyramidal or tabu in habit with predominant *c e p*; seven new forms are noted, some w hemihedral development; $a:c = 1:1{\cdot}5477$. Crystals from Hought show two new forms. L. J. S

Maucher (Albert). *Das Molybdänglanz- und Powellitvorkommen Hüseyin beyobasi, Kasa Keskin, Vilâyet Ankara, Türkei.* Ze angewandte Min., 1938, vol. 1, pp. 103–114, 5 figs.

Molybdenite occurs in nests and crevices in granite and in pegmati quartz and pyrite-magnetite veins. Pseudomorphs of powellite af molybdenite are found in the oxidation zone. The powellite gave Mo 69·84, CaO 27·65, MgO trace, Fe_2O_3 0·54, quartz 1·91, H_2O 0·08 100·02, and unit-cell dimensions a 7·37, c 11·40 Å. L. J. S.

Maucher (Albert). *Das Antimonit- und Gudmunditvorkommen Turhal (Türkei).* Fortschr. Min. Krist. Petr., 1937, vol. 22, pp. xl xlvii.

A quartz-stibnite vein in schists and diabase has yielded gudmund [M.A. **4**–12], berthierite, and ullmannite (?). L. J. S.